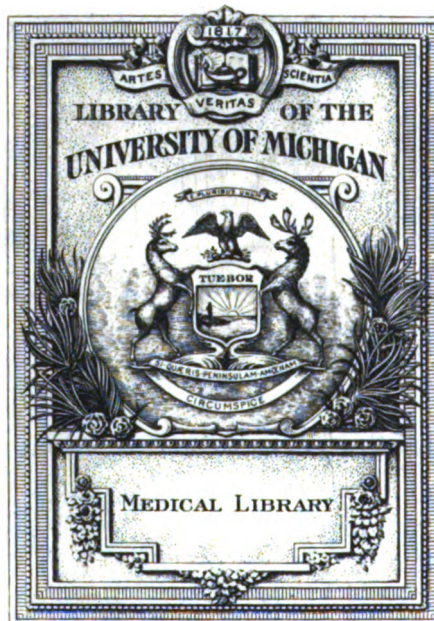

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ON THE SPREAD OF ENTERIC FEVER BY URINE, AND ITS PROPHYLAXIS.

By CAPT. E. BLAKE KNOX.

Royal Army Medical Corps.

(1) PREVALENCE OF ENTERIC FEVER AMONG BRITISH TROOPS.

THE prevalence of enteric fever among British troops in time of war and occasionally in epidemics in foreign stations, indicate that each and every link in the chain of infection by the *Bacillus typhosus* must be studiously worked at, recognised, and rigorously attacked, experimentally and otherwise, in time of peace, if we as officers responsible for the health efficiency of the Army are to prevent a repetition of the ravages of this great life-destroyer, the greatest that has afflicted every army that ever took the field in time of war. Among the links in the chain of primary infection there stands out one above all others, and recognised by all, as the arch source of all infection; this, needless to say, is the excreta of enteric patients.

Under this heading falls, in the too menial guise of sub-agent, the urine—a sub-agent which I propose to prove as worthy of consideration, and one that may have a much more important bearing on the dissemination of enteric fever than that with which it is commonly accredited or certainly recognised, by virtue of its very varying, erratic, and difficult bacteriological analysis.

The possibility of investigating such a source of infection must

of necessity be intimately associated with a series of continuous observations of the urine of a large number of enteric patients. Such opportunity presented itself to me in the patients arriving at the Royal Victoria Hospital, Netley, during the latter period of the South African War, when all patients at any stages in the disease that were available were placed under my personal observation for treatment. Many of these cases were in the first week of the disease; others close to it, and others, again, convalescing. I have also had the opportunity of observation and treatment of other cases in the military hospitals at Bulford, Aldershot, and latterly in Bellary, Madras, India. Before detailing the technique of the experiments carried out by me it will not be out of place to summarise some of the work done by other observers of recent years relating to enteric bacilluria. Neumann¹ (1890) examined the urine of forty-eight cases of enteric and found bacilli in eleven instances. The bacilli were always present in large numbers, and in some cases persisted far into convalescence. Wright² and Semple (1895) obtained bacilli in six out of seven cases. Besson (1897) found typhoid organisms in six out of thirty-three cases. Horton Smith³ (1897) examined the urine of seven patients with positive results in three, and stated that he could often demonstrate the bacilli in cover-glass preparations from the urine; and further that the organisms may be so numerous as to render the urine distinctly turbid. Petruschky⁴ (1898) obtained three positive results in fifty cases. In one case bacilluria persisted two months after the beginning of convalescence; in another case six weeks; and in a third patient eight days after the temperature had become normal. In one of his cases Petruschky estimated that 1 c.cm. contained 170,000,000 bacilli.

Richardson,⁵ of Boston, in three series of investigations (1898-1899), obtained positive results in eight out of thirty-seven in the first, fourteen out of sixty-six in the second, and twenty-three out of 104 in the third series.⁶

¹ Neumann, *Berliner Medizinischen gesellschaft*, 1900.

² Wright, *Lancet*, 1895, vol. ii., p. 196.

³ Horton Smith, *Trans. Roy. Med. and Chir. Soc.*, 1897.

⁴ Petruschky, *Ctrbl. f. Bakter. u. Parasitenk.*, Bd. xxiii., No. 14, 1898.

⁵ Richardson, *The Journal of Experimental Medicine*, New York, 1898, No. 3; and 1899, No. 1.

⁶ Richardson, *Journal of the Massachusetts Association of Boards of Health*, July, 1899.

Horton Smith¹ (1900) in forty-five cases found bacilli in seventeen, thus giving a percentage of nearly thirty-eight for positive results. This undoubtedly high percentage he attributes to the fact that six of his cases were those in which the abnormal condition attracted attention and in which a bacteriological examination of the urine was requested. Schuder² found the *B. typhosus* in five out of twenty-two cases, and states that from a close examination of collective records of other observers it has been found in 117 cases out of 599, or in a percentage of 29·55. Neufeld³ (1899) examined twelve cases, three of which had bacilluria caused by typhoid bacilli.

The comparison of these results, the importance of which collectively are manifest at first sight, and which give evidence of a condition so frequently met with as to be a menace to the public health, is a condition recognised more than a dozen years ago, but unfortunately one that does not seem to have attracted the attention that should be its due. It certainly has been my experience, and also that of many others whom I have questioned on the subject, that while modern lecturers and teachers have laid particular stress on the infective nature of the stools, few, if any, have urged prophylactic measures against the urine, which must now be considered as worthy of our attention.

(2) THE CHARACTERISTICS OF THE *BACILLUS TYPHOSUS*.

It must not be forgotten that year by year our knowledge of the cultural characteristics of the enteric bacillus has improved, the value of highly diluted reactions with specific serum has modernised teachings but a few years old, and many a bacillus that would ten years ago—aye, much less—pass muster as a *B. typhosus* will not to-day be accepted as such by those familiar with the “mill” through which the modern bacillus has to go before its position is accredited, and the so-called *B. typhosus* of even a few years ago would under modern diagnosis find itself relegated to a back seat in the “democratic” coli group. In prosecuting any investigations as to the personality of any bacillus in the urine no bacteria can be accepted that does not fall in line with the formula promulgated by Firth and Horrocks⁴ and now generally accepted, which is as follows:—

¹ Horton Smith, “Goulstonian Lectures,” 1900, p. 50.

² Schuder, *Zeitschrift für Hygiene*, xxxviii., p. 353.

³ Neufeld, *Therapist*, January 15, 1901.

⁴ *British Medical Journal*, 1902, vol. ii., p. 937.

(1) A non-spore-bearing, actively motile rod, decolourising by Gram; (2) giving a thin, moist, greyish-white growth on an agar slope; (3) yielding surface colonies on gelatine plates as thin bluish films with an irregular margin which do not liquefy gelatine, and require seventy-two to ninety-six hours' incubation at 22° C. before showing these specific characters; (4) showing a turbid or diffuse growth in broth without pellicle; (5) producing no gas in glucose media; (6) yielding no indol in peptone and salt solution after seven days' incubation at 37° C.; (7) giving a moist, colourless growth on potato; (8) not changing milk after seven days' incubation at 37° C.; (9) producing not more than 6 per cent. of acidity in litmus whey after seven days' incubation at 37° C., when titrated with decinormal alkali; (10) producing no growth or change in reaction when grown for twenty-four hours at 37° C. in Proskauer and Capaldi's No. 1 medium; (11) growing with production of marked acidity after twenty-four hours at 37° C. in Proskauer and Capaldi's No. 2 medium; (12) yielding acid but no gas in 1 per cent. glucose peptone at 37° C. after twenty-four hours; (13) not affecting in any way 1 per cent. lactose peptone at 37° C. after twenty-four hours; (14) agglutinating at once with an anti-typhoid serum diluted 1 in 1,000.

(3) METHOD EMPLOYED IN COLLECTING THE URINE OF ENTERIC FEVER PATIENTS FOR MACROSCOPIC EXAMINATION.

For the purpose of making as full and as accurate an investigation as possible of the urine of my enteric patients, with regard to the turbidity said to occur at and after the onset of typhoid bacilluria, I adopted the following procedure: A number of clear glass half-litre flasks, such as are commonly used for laboratory purposes, were borrowed from the departments of the Professors of Pathology and Hygiene at the Army Medical School, Netley. Each of these flasks, after being thoroughly sterilised, and provided with a cotton-wool pledget as a stopper, was labelled with the name of the patient for whose use it was intended. Each typhoid patient was directed to micturate into the flask direct, and the urine taken for examination was invariably that first passed from the bladder each morning, as such urine would have the advantage, in coming from a full bladder, of being in all probability the largest amount evacuated at the one time during the twenty-four hours, and being high in specific gravity, the facility for observation of turbidity would be increased; the danger of extra-vesical decomposition would be

reduced to a minimum, as my observations were made at an early hour each day.

Before paying my morning visit to patients all the urine flasks of each ward were collected in the ward lavatory and placed in rows on a table in good light, and in such a position that I could readily contrast their colour and density.

For the purpose of arriving at the means of classification of colour and transparency, I adopted the terms "dark," "medium," "light," for colour; and "clear," "slightly turbid," "turbid" or "muddy" for transparency. The last-named term I used to indicate the condition produced by a deposit of chemical salts, urates, phosphates, or oxalates.

For the sake of abbreviation and for combinations of the varied conditions found, I employed the letters "D," "M," "L," for colour; and "C," "ST," "T," "M," for transparency: these abbreviations could be easily and rapidly filled in on a tabular form having spaces for each day of the month opposite each patient's name. Thus a diurnal record of the appearance of each patient's urine was recorded.

All suspicious urines were microscopically and bacteriologically examined, when possible, without delay. In the case of a proposed bacteriological examination, in order to avoid the hazard of extravescical contamination of a urine which had been previously noted as suspicious from its colour and turbidity in the flask, the following method (the sterility of which I tested on a normal subject and with the efficiency of which I was satisfied) was adopted. The glans penis of the patient was thoroughly washed with corrosive sublimate (1 in 1,000), and he was told to pass his urine into an ordinary vessel without touching it with the penis. He was then told to direct the last of the stream into a small, sterile, wide-necked bottle, and this was at once closed up under the usual precautions and conveyed to the laboratory for microscopic examination.

(4) GENERAL OBSERVATIONS ON THE MACROSCOPIC CHARACTERS OF THE URINE AS OCCURRING DURING THE COURSE OF ENTERIC FEVER.

(a) *Quantity*.—The quantity of urine passed by a case of enteric fever varies within wide limits, and seems to depend to a great extent upon the stage of the disease, the amount of fluids ingested, and upon the degree of activity of the cutaneous surface of the body. In the earlier stages of the fever it was always observed to become

much diminished, and during convalescence it either reached the normal or rapidly increased. *A suddenly occurring abundant excretion of urine in the case of a convalescing enteric patient should be noted as of great importance, for in many cases I found it to be diagnostic of the onset of bacilluria.*

(b) *Colour*.—Following the general rule in fevers, the colour was found to be always intensified from concentration during the height of the attack (*i.e.*, during the second and third weeks), and it lightened in shade as convalescence was reached. *Urine of a straw-yellow shade, with an opalescent shimmer, was found to be the most suspicious, and if associated with turbidity, almost invariably contained pathogenic bacteria.*

(c) *Transparency*.—When no chemical deposit of urates, phosphates, or oxalates was present in the urine during the disease, it was in most cases clear. *Any turbidity not due to these salts was always found to be associated with swarms of micro-organisms.* The clear urines and the urines showing chemical deposits were in the majority of cases not observed to contain any pathogenic bacteria.

(d) *Specific Gravity*.—This followed the usual laws as laid down for fevers in general.

(e) *Bacilluria*.—The occurrence of a sudden and abundant excretion of urine of a pale yellow or straw-yellow colour with an opalescent shimmer and showing a distinct macroscopic turbidity was found in all cases to contain bacilli, either the *B. typhosus* or the *B. coli communis*.

Such an occurrence, though a typical bacilluria, rarely produced any clinical symptoms referable either to the bladder or kidneys. A few cases, nevertheless, did complain of frequency of micturition and slight pain after micturition, with a little tenderness over the region of the bladder; it was in these cases that the *B. coli communis* was found to exist in such enormous numbers that I believe the cystitis was mainly due to that organism. No pus in quantity deserving mention was perceived in any instance. It was noticeable that the larger percentage of infected urines occurred in those cases in which the clinical symptom of delirium had been of rather long duration, or where a patient had reached the stage of convalescence in a state of extreme emaciation; hence I am inclined to think that bacilluria is much more likely to occur in cases where the pyrexia is distinctly marked than in those where it is less pronounced.

I have made examination of the urine of 100 cases of enteric

fever for the purposes of this report. Seventy-five of these were examined daily while in the acute stage and later, in wards under my personal charge. Twenty-five were convalescents on arrival and their urine was daily examined by me in the convalescent wards of the Royal Victoria Hospital, Netley, by kind permission of Lieut-Col. Allport, R.A.M.C. Among the former thirty-seven developed bacilluria at some period of the disease, and of the latter fourteen developed the same affection, thus giving a total percentage of fifty-one cases of bacilluria.

I made an attempt to keep a register of the exact day of disease on which the bacilluria occurred in each of my cases, but unfortunately this proved futile in the majority, as many of the patients had developed the disease before coming under my treatment and others had been ambulant cases. In nearly half the cases, however, I was able to arrive at a conclusion with some degree of exactitude, and the earliest day of the disease that bacilluria was noted was in one case on the twelfth and three on the thirteenth, and the latest was on the one hundred and thirty-seventh day. It may be of interest to contrast these figures with the *data* of other observers.

Horton Smith¹ states he has isolated the *B. typhosus* as early as the thirteenth day of the fever, and that in this case it had undoubtedly been present from a much earlier date. He has also isolated the bacillus in three other cases on the twenty-fourth, twenty-seventh and fifty-first days respectively. Richardson² is of opinion that it may occur at the earliest on the fifteenth day of the disease, but that the third or fourth week is more favourable. Kronjajeff³ has not found the bacillus before the third week. Neufeld⁴ found bacilli in one case on the twentieth day in acid urine to the large amount of 60,000,000 per cubic centimetre, and in another case to the amount of 20,000,000 per cubic centimetre; this latter case was complicated by cystitis and the urine was acid. Neufeld is of opinion that bacilluria may occur at the earliest towards the end of the second week, or about the beginning of the third in a few cases, but that in the majority of cases it appears later, and frequently it may be entirely absent until convalescence.

(5) METHOD EMPLOYED IN ISOLATING BACILLI FROM THE URINE OF ENTERIC FEVER PATIENTS.

Great difficulty accompanies any attempt to isolate the *B. typhosus* from bacilluric urine owing to the fact that in bacilluria

¹ Horton Smith, *loc. cit.*

³ Kronjajeff, see Neufeld, *loc. cit.*

² Richardson, *loc. cit.*

⁴ Neufeld, *loc. cit.*

the urine almost invariably contains swarms of other organisms, prominent amongst these being the *B. coli communis*. This organism, though not a normal inhabitant of enteric urine, yet seems always associated with the *B. typhosus* when the latter is present, and in very many of the severer cases of bacilluria in which I have been unable to detect the typhoid bacillus, I have isolated pure cultures of different varieties of the coli group.

For the purpose of investigating the urine in typhoid bacilluria and the subsequent effects of urotropine on patients suffering from bacilluria, I employed several of the methods laid down in the textbooks for the isolation of the *B. typhosus* from water, but had to abandon most of these methods as either not applicable to urine or as impossible to carry out in the time at my disposal. I finally employed, with considerable success not only in results, but in gain of time, a method devised by Horrocks¹ for the isolation of enteric bacilli from stools. The more important details of this method (which is a modification of Parietti's process, combined with the use of glucose-litmus-agar plates, based on the difference of the acid-producing powers of *B. coli* and *B. typhosus*) may be summarised as follows: The turbid urine of an enteric patient, suspected to be bacilluric, after having been drawn off under the sterile precautions previously described in (3), is shaken up and a small quantity measured off and allowed to evaporate on a slide; this is stained and a rough estimate is made of the number of organisms present, so that if they appear abundant it is necessary to dilute the urine with sterile water for the purposes of further bacteriological examination. Should only a few organisms be present 1 c.c. is spread out in a series of lines over the surface of a glucose-litmus-agar plate with a platinum needle. This medium contains 2 per cent. glucose added to ordinary agar, containing sufficient aqueous extract of litmus to give it a light blue colour. When this medium is required for use it is melted and cooled down to 42° C. and a decinormal solution of NaHO added, so that each 10 c.c. of the medium has an alkalinity equal to 1.8 c.c. of decinormal alkali. The alkaline glucose-litmus-agar is now poured into Petri dishes and allowed to solidify, and when "set" these are placed in an incubator for twenty-four hours, which process has the double advantage of testing their sterility and allowing the medium to become more rigid. The plates are then ready for use. After inoculation with the suspected urine they are incubated,

¹ Horrocks, "Introduction to Bacteriology of Water." Churchill and Co. 1901.

with covers downwards (as recommended by Firth), at 37° C. for twenty-four hours. Should the *B. typhosus* be present its colonies appear on the surface of the plates as small, round, transparent droplets of a *bluish* tint, while the medium surrounding them is of a very light delicate pink shade, due to the fact that the small acid-producing power of this organism is almost neutralised by the alkali of the medium. The colonies of the *B. coli* are larger, more opaque, and *red* in colour, while their relatively higher acid-producing power colours the surrounding medium a brighter red by converting the alkali litmus into acid litmus. Colonies of cocci did not change the blue of the media and were easily discarded.

All suspicious blue colonies with a delicate pink zone of media around are now marked and individually examined, each being first "fished" and examined in a hanging drop. If motile bacilli like the *B. typhosus* are seen, samples of this drop are taken and tested for agglutination with 1 in 50, 1 in 500, and 1 in 1,000, dilutions of anti-typhoid serum of a known strength added to equal portions of the suspected drop. Should a positive result be obtained a sample of the original emulsion is planted out on an ordinary agar slope, and the resulting growth, after further incubation, tested still further with the various other media used for the differentiation between *B. coli* and *B. typhosus*, of which the following are among the more important: Gelatine plates, stab and slope cultures, Witte's peptone and salt solution, milk, litmus whey, neutral red glucose agar, glucose gelatine and lactose gelatine shake cultures, and glucose agar, gelatine 25 per cent. incubated at 37° C., potato, Proskauer and Capaldi's Nos. 1 and 2 media, neutral broth. As no bacillus isolated from urine by the glucose-litmus-agar method or any other method can be bacteriologically stated to be the *B. typhosus* until it has passed through the final tests enumerated, some estimate can be formed of the enormous task that would be involved in carrying out a series of investigations daily throughout 100 cases of enteric fever.

(6) EXPERIMENTS UNDERTAKEN TO TEST THE BACTERICIDAL POWER OF UROTROPINE WHEN USED AS A MECHANICAL MIXTURE OUTSIDE THE BODY WITH NORMAL URINE, TO WHICH ACTION TYPHOID BACILLI HAD BEEN ADDED.

Before investigating the effects of urotropine on the urinary system of enteric patients, I thought it advisable to try its action on normal urine, and made the following series of experiments. To ensure sterility and to be the better able to check my results, I used

my own urine as a "control" to correct the results of each and every experiment. A series of sealed tubes of urine were taken from the patient under the precautions laid down in (3). Each of these tubes contained a known quantity. Half of them were put into an autoclave and still further sterilised. To each tube was added a known quantity of urotropine and also a known quantity of an active culture of typhoid bacilli of twenty-four hours' growth in bouillon. After inoculation, these tubes were put into an incubator together with control tubes and examined every twenty-four hours in order to ascertain the "killing-off" power of urotropine when mixed with urine outside the body. In order to prove that the bacilli were able to grow in similar urine to which no urotropine had been added, such a tube was also inoculated and put into the incubator; this tube on examination twenty-four hours afterwards showed a dense turbid growth of active typhoid bacilli; the other tubes showed a growth in the inverse ratio to the amount of urotropine added. The bactericidal power of the drug under these conditions can be seen from the following table:—

TABLE I.—SHOWING EFFECTS OF UROTROPINE WHEN MIXED WITH NORMAL URINE UPON THE GROWTH OF A KNOWN QUANTITY OF *BACILLUS TYPHOSUS*.

Number of hours incubated before examination	2·5 % solution of urotropine in normal urine	5 % solution of urotropine in normal urine	7·5 % solution of urotropine in normal urine	10 % solution of urotropine in normal urine
24	+	—	—	—
48	+	—	—	—
72	+	+	—	—
96	+	+	—	—
120	+	+	+	—

(7) EXPERIMENTS UNDERTAKEN TO TEST THE BACTERICIDAL POWER OF UROTROPINE AFTER EXCRETION IN THE URINE OF A NORMAL SUBJECT OF AN ACTIVE CULTURE OF *BACILLUS TYPHOSUS*.

In order to ascertain whether urotropine retained its bactericidal power after passing through the organism when brought into contact with active typhoid bacilli, I made the following series of experiments, and again to be the better able to check the results on a normal subject, I underwent a course of the drug myself, taking 10-grain doses thrice daily and following the precautions laid down in (3) to ensure sterility. The stage of autoclaving was omitted, as I found that owing to the volatilising nature of the drug it lost its properties on being heated to a high temperature. The

same methods of examination as laid down in the preceding paragraph were followed, and the results obtained were noted as follows :—

TABLE II.—SHOWING THE BACTERICIDAL POWER OF UROTROPINE WHEN TAKEN INTERNALLY BY A NORMAL SUBJECT, AND EXCRETED IN THE URINE, THIS URINE THEN BEING INOCULATED WITH *BACILLUS TYPHOSUS*.

Number of hours incubated before examination	3 c.c. urine, 7 c.c. sterile water	5 c.c. urine, 7 c.c. sterile water	5 c.c. urine, 3 c.c. sterile water	10 c.c. urine	10 c.c. of same urine sterilised in autoclave
25	+	+	—	—	+
48	+	+	+	—	+
72	+	+	+	—	+
96	+	+	+	—	+

(8) ON THE ADMINISTRATION OF UROTROPINE AND ITS EFFECTS.

Urotropine is a white crystalline powder readily soluble in water and aerated water; in alcohol it dissolves with greater difficulty and for this reason its administration ought to be some hours after stimulants are prescribed. It must be given well diluted or else a burning sensation is experienced in the pharynx; the manufacturers recommend its administration in doses from 3 to 7½ grains thrice daily, well diluted in water—preferably aerated water—and they state that up to 60 grains can be given daily.

After some weeks' trial, I found that the best results were obtained by the administration of 10 grains thrice daily in a tumblerful (half pint) of milk and soda-water, it being thus tasteless and causing no discomfort to patients, while its administration with milk avoided the ingestion of extra fluid to the necessary milk diet of enteric patients. During convalescence I gave it in combination with lemonade made from fresh lemons, a prophylactic treatment I have adopted with considerable success against the occurrence of thrombosis as a post-typhoid complication, and of which I hope to report later. Daily doses of urotropine of 30 grains, in doses of 10 grains thrice daily, were administered as routine treatment on the appearance of turbid urine, and in no case did I find any ill-effects from the drug, or discomfort to the patient. Suppan states urotropine improves the appetite, but such a condition is hard to estimate in enteric fever. In the majority of cases the bacilluria passed off and the urine became clear within a few days after administration of the drug. In a few of the more tenacious cases the drug was pushed in larger doses up to 20 grains thrice daily, and in some of these cases the patients complained of a slight

burning sensation in the bladder, with pain referred to the glans penis on micturition, but in these cases the symptoms disappeared on the discontinuation of the drug for a few days. In no case has either hæmaturia, urticaria, or tinnitus resulted from extreme doses of the drug.

(9) RESULTS OBTAINED IN ISOLATING MICRO-ORGANISMS FROM THE URINE OF ENTERIC FEVER PATIENTS AND THE EFFECTS OF UROTROPINE ON THE SAME.

Owing to the enormous difficulties to be encountered and the prolonged time required under the more recent confirmatory tests before definitely settling that a bacillus was really the *B. typhosus*, I am unable to furnish a report of the exact percentage of its occurrence in my cases. In five cases, however, I worked the bacilli out to the bitter end and diagnosed their presence, and in many of the other cases of bacilluria I passed the bacilli causing it through some of the confirmatory tests. From a long series of daily examinations of the urines of my 100 cases I find that the bacilluric urines were always more or less turbid, and that this turbidity was always associated with the presence of the *B. typhosus*, the *B. coli*, or staphylococci. Sometimes all three organisms were present, sometimes either the *B. coli* or staphylococci preponderated; in no case have I found the *B. typhosus* alone, *i.e.*, in pure culture, as some observers have stated, unassociated with the *B. coli*. Such a condition of affairs made the subject of the effects of urotropine upon bacilluria an extremely difficult one to report on, had I not found that not only had this drug bactericidal effects on the typhoid bacilli in urine, but also on the *B. coli* and its sub-families. On turbid urine containing cocci the drug had but little effect, and many of the tenacious cases which resisted the drug were entirely due to these micro-organisms. In no case have I been able to find *B. typhosus* in clear urine, in which, as a rule, no pathogenic organisms were ever found; in a few cases, however, bacilli of the coli group were isolated, but all of these passed the simpler coli differentiation tests. True bacilluria, due either to *B. coli* or *B. typhosus*, was found to be checked, either partially or totally, on the administration of urotropine; in no case were typhoid bacilli found after it had been in use for a week, and in the majority of cases the *B. coli* had also disappeared from the urine by this time. On cocci the drug had no effect. It was noted, however, in several of the more severe

cases of bacilluria that had been controlled by urotropine, that discontinuation of the drug for periods varying from a week to fourteen days caused a return of the bacilli to the urine. Urotropine cannot, for this reason, be said to destroy the bacilli in the system: the most that it can apparently do is to kill off by its presence any bacilli excreted by the kidneys and to render the urine by some means a medium unfavourable for their growth. This action in itself is a most important one, for otherwise when the drug is not used the excretion of even a single bacillus from the kidney means its immediate multiplication to millions in the vesical urine, which is under ordinary conditions a most suitable medium.

(10) SUGGESTIONS AS TO PROPHYLAXIS AGAINST THE SPREAD OF ENTERIC FEVER BY MEANS OF THE URINE AND OTHER PATHS.

As there can be no doubt whatever that a certain proportion of cases of enteric fever patients at some time during the fever, or during convalescence, are subject to bacilluria, and that this bacilluria is in some way associated with the presence of the *B. typhosus* in the bladder, where the urine offers a medium in which it can readily multiply, a condition of affairs is presented whereby a convalescent enteric patient can become a danger to the community by micturating in places other than the recognised urinals, not only while in hospital but also after his discharge from hospital, when he reaches his home. When we come to consider the means at our disposal for the disinfection of such urine, it will be seen that any system of extravescical antiseptics will become next to useless, not from reason of their actual efficiency when brought into contact with the bacilli, but from their very means of application. No man can either be induced to use the recognised urinals where such disinfectants are used, or use disinfectants himself, and the only means at our disposal to prevent infection by pollution of water supplies and camps by urine is to put each and every case of enteric fever, in which the urine is noted to be turbid, through a course of urotropine, 10-grain doses three times daily until the urine clears and keeps clear; this can be estimated by any medical man. All enteric fever cases in a campaign ought to be systematically treated with urotropine during convalescence, as under the conditions of war we have neither time nor material for examinations of urine, and the surrounding conditions are such that the infection power of the urine of one enteric fever case may be such as to contaminate

the water supplies of a whole brigade or more. In the case of convalescent enterics returning to their homes, a course of urotropine, under supervision, if possible, of a medical man, should be given, but this is not absolutely necessary, as the drug is harmless and might be issued in tabloid form (pinked). Attention should be paid to the urine of convalescents before rejoining their units. All men who state, or whose medical history sheets show, that they have suffered during the year previous from typhoid should be made pass water for naked-eye examination, and this, if turbid, should be referred for bacteriological examination. Without this precaution no enteric fever patient, even when well to all appearances, ought to be returned to active service within two years of the attack. Richardson¹ records a case seen at the John Hopkins' Hospital in which, five years after typhoid fever, the urine showed evidence of marked cystitis and typhoid bacilli in pure culture.

We keep small-pox patients, scarlet-fever patients, and diphtheria patients in strict isolation while under treatment and until their systems are believed to be free from infection. We know the clothes, bedding, and surroundings are infected, and we take steps to overcome the spread of the disease; we know that the disease will be liable to spread if we do not take these steps. Why is it that enteric fever is not considered worthy of similar attention? We know that it does not and cannot arise *de novo*, but that it arises from infection derived from some other typhoid-fever case. Bearing this in mind, is it not better to stamp out the infection at its origin than let it spread, and then only wake up when we are perhaps in the midst of an epidemic. What is the use of shutting the stable door when the horse is out, and what is the use of urging men to boil water, when they will not, unless we make them do it unconsciously by giving them an extra ration of tea on service? If we are to reduce enteric fever we must attack it frontally; we must destroy what starts the infection; each case as it arises must be taken in detail; the bacilli must be annihilated. We must change our whole present *régime* and treatment, and abolish half-hearted prophylactic measures if we are to succeed. First and foremost, enteric fever must never be treated in the general wards; a typhoid patient should be as rigorously isolated as a small-pox one, for he is even more infectious. One may say, if this be so, why then do we not have more of the disease? This is readily answered. The

¹ Richardson, *The Journal of the Massachusetts Association of Boards of Health*, July, 1899.

human organism when in health can resist some diseases more than others: thanks to the Divine providence, we can resist the germs of typhoid more than we can resist some of the other diseases, or we would at times be saturated with them. As long as the individual keeps in good health, a normal gastric juice and the strong bactericidal properties of the blood afford him a fairly unassailable position against any moderate dose. But, on the other hand, let our vitality be low, be it from long marches, improper food, or empty bellies, as was often the case in the late Boer war—take, for example, Paardeberg, when the troops had also their digestive organs in a state of almost chronic catarrh from muddy water, a condition most suitable for infection; or take the case of a dyspeptic gourmand at some aldermanic feast; what better medium can be found for an enteric-infected oyster than the mucous membrane of a catarrhal stomach? What is the use of attacking water, sewerage, oysters, and the like, if we neglect the source from which all infection comes? The enteric patient is the fountain head; every excretion and secretion from his body is infective at some time or another during the disease: it is the very fact of their being infective only sometimes that makes us lax. If they were infective always and at all times during a case of fever, I have not the least hesitation in stating we would have much less enteric, for we would then of necessity have to take very urgent and very strict prophylactic measures, and give this subject the attention that is its due. Everything an enteric fever patient touches, or is brought into contact with, must be regarded as infective, every utensil he uses, from the tumbler he drinks out of to the bed pan he has recourse to, the very clothing he wears, sheets, blankets, bedstead, floor and surrounding walls, are all swarming with bacilli, the air, dust, and flies in the room. Disinfection in such a case at first sight may seem colossal, but it is not. Burn, boil, or bury deep everything connected with an enteric patient save himself and his attendants and the room or tent he is treated in, and disinfect these thoroughly. What you cannot kill by fire kill by boiling, and what you cannot kill by either, disinfect by some other means. Major Cummins,¹ R.A.M.C., recommends boiling excreta with a small quantity of crude carbolic acid added; this is an excellent method of disposal, it takes less fuel and is cheaper and less offensive than burning. Boil or sterilise by heat all feeding utensils and remains of food used by patients; for we know the danger attendants and other patients run. Steep

¹ Cummins, *British Medical Journal*, 1900, vol. ii., p. 136-9.

in disinfectants or sterilise by heat all clothes, bed-clothes, blankets, handkerchiefs, swabs, and every form of fabric used by enteric patients. Disinfect their cots and surrounding walls in barracks, obtain and disinfect all clothing and bed clothing used before admission to hospital, and use common sense in detecting and overcoming any other means of infection. See that attendants on enterics know the responsibility of their duties and keep up their health with good food, short spells of duty, and lots of out-door exercise.

[I think the reputation of urotropine has stood the test of exhibition in practice pretty well. In my own hands I have found it not altogether infallible, but where it has failed to sterilise, it has always effected a material reduction in the degree of bacilluria; but I am not in a position to speak of its effect on *B. typhosus* apart from *B. coli*. I have only once known it set up actual strangury or hæmaturia, but I have never given it in larger doses than 10 grains three times a day. I believe I am right in believing that it is excreted in a form chemically different from urotropine, but this would not affect Captain Blake Knox's practical deduction as to its disinfectant action, as he found the urine to be an efficient steriliser when undiluted, according to his second table. I think the only practical objection to its *wholesale* administration is the expense of urotropine.—Dr. F. F. CAIGER.]

“SLEEPING SICKNESS IN UGANDA.”¹

BY COLONEL DAVID BRUCE, F.R.S.
Royal Army Medical Corps.

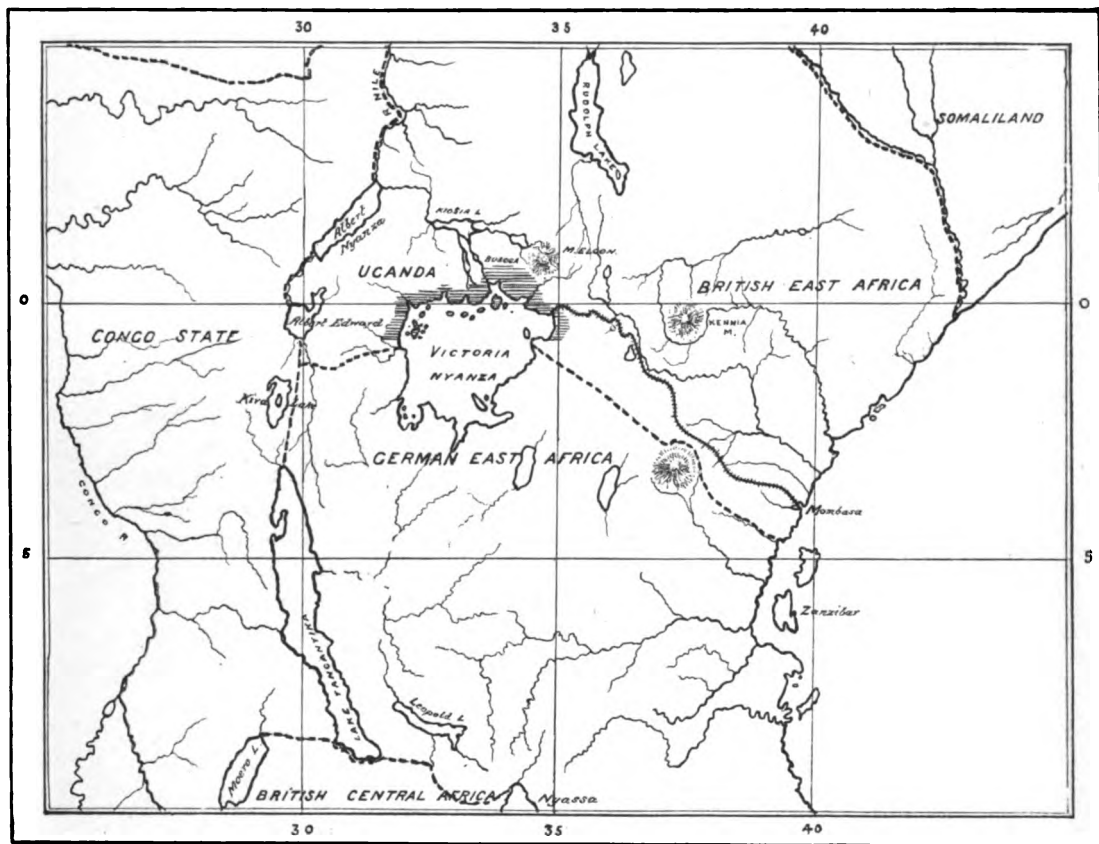
FIRST allow me to remind you of the general position of Uganda in Central Africa, which is represented in the following map. The port of entry into the country is Mombasa, the Uganda railway running from here to Victoria Nyanza. On the north-west shore of the lake is Entebbe, the seat of the English Government in the Uganda Protectorate. Kampala, or Mengo, the native capital, lies some 20 miles to the north-east. Uganda proper lies to the north-west of the lake, Ankole and Unyoro to the west of Uganda, and Busoga to the east. The other lakes, Albert Nyanza, Lake Albert Edward and Lake Tanganyika, form the boundary between the Uganda Protectorate and the Congo State. To the east of Busoga is British East Africa.

The portion of the map which is shaded with horizontal lines represents the part of the country in which sleeping sickness is raging—that is the sleeping sickness area. And first let us consider how the disease was introduced into the country. There are various theories in regard to this. It is quite impossible, in my opinion, that the disease could have been indigenous in the country. None of the chiefs or missionaries, who have been many years in the country, ever saw a case of the disease before the year 1901. In April of that year the Drs. Cook, Medical Missionaries at Kampala, reported the first case.

It first broke out in the part of the country lying to the east, called Busoga. Dr. Moffatt, C.M.G., the Principal Medical Officer of Uganda, is of opinion that the disease was introduced into this part of the country when Emin Pasha's Soudanese and their wives and followers, numbering some 10,000, were brought into and settled in Busoga. These natives were brought from the edge of the Congo territory lying to the west, and therefore from a country in which sleeping sickness has been endemic for an unknown time. It seems, then, quite probable that some of these natives, brought in with the remains of Emin Pasha's expedition, may have brought the disease into Busoga, and that from this focus it slowly spread to the neighbouring population. Be that as it may, the disease broke out in this part of the country some time between 1896, according to

¹ A discourse delivered at the Royal Institution, London, Friday, April 22, 1904.

Dr. Hodges, and 1901, when the disease was definitely diagnosed, and in a short time reduced a populous and richly cultivated country to a depopulated wilderness.



MAP SHOWING POSITION OF UGANDA.

Now, having discussed the introduction of sleeping sickness into Uganda, let me for a few minutes draw your attention to the disease

¹ The maps, tables and illustrations in this paper are taken, with the permission of the Royal Society, from the "Further Report on Sleeping Sickness in Uganda," by Lieut.-Col. David Bruce, R.A.M.C., F.R.S., David Nabarro, M.D., and Capt. E. D. W. Greig, I.M.S. Harrison & Sons, London.

The illustrations showing the parasites have been kindly lent by the *British Medical Journal*.



FIG. 1. — "Kitaroma."

20



FIG. 2.—“Sabiri.”

itself. Sleeping sickness is a curious disease, and is essentially a disturbance of the functions of the brain. A slow chronic inflammatory process takes place in the brain substance, which after a time gives rise to the peculiar symptoms of the disease. But for a long time, sometimes years, the preliminary symptoms of sleeping sickness may be of so slight a character that no one suspects there is anything wrong. That is to say, the sleeping sickness patient may go about doing his ordinary work for years without his friends noticing there is anything the matter. But gradually a slight change in his demeanour becomes evident; he is less inclined to exert himself; he lies about more during the day, and at last his intimates see that he has the first symptoms of this absolutely fatal malady.

Fig. 1 is a photograph of a typical case of sleeping sickness.

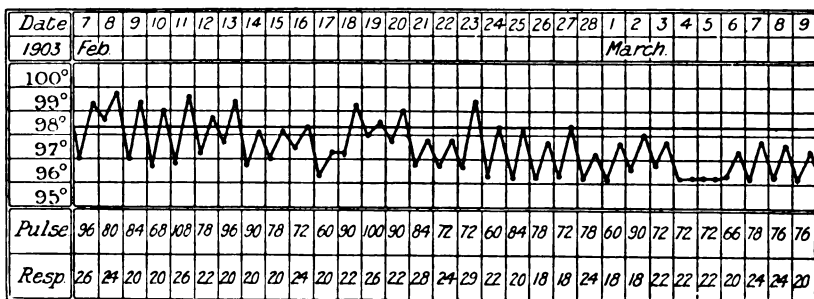
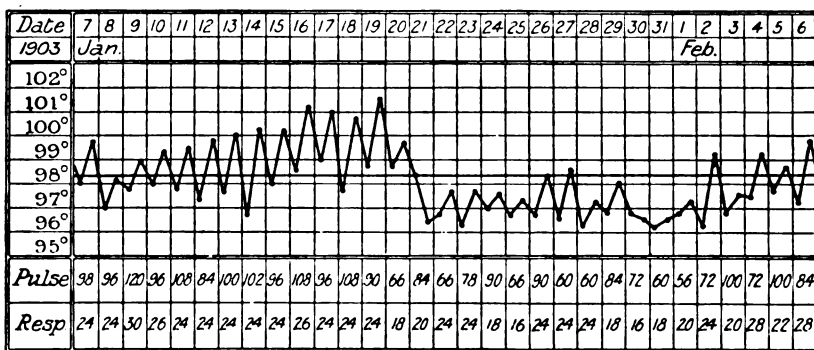
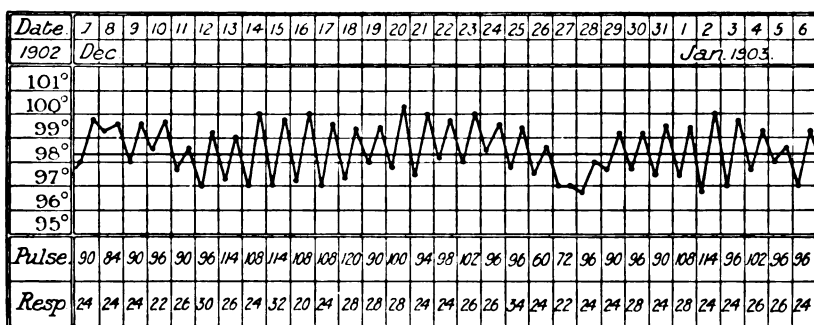
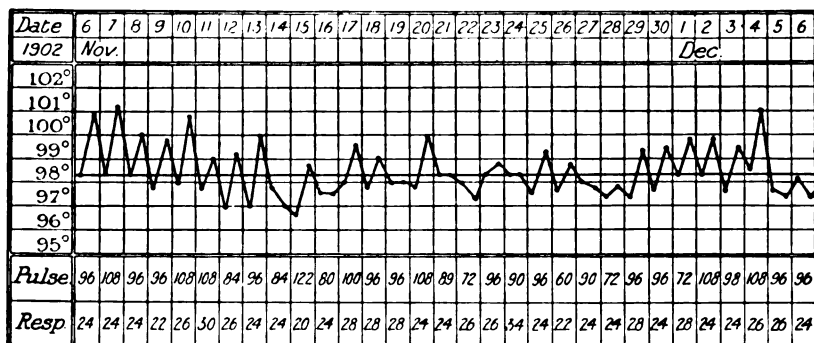
Mark the sad, heavy, dull-eyed, apathetic face. The man is, however, well nourished, and this is the rule if the patients are well nursed and fed. If you examine this man's pulse, you find it rapid and weak. If you ask him to hold out his hands, you find that they are weak and tremulous. When asked to walk, his gait is weak and uncertain. When he answers a question, his voice is weak, indistinct and monotonous. The symptoms gradually deepen, and after several months the patient is unable to walk, unable to speak, and unable to feed himself. He is then, of course, altogether confined to his bed, lying in an absolutely lethargic condition all day long. It is in this stage that the sick are often neglected by their friends, they remain unfed, and so become emaciated, as Fig. 2 shows.

In regard to other symptoms it may be mentioned that during the illness the temperature has shown some elevation of an irregular character, often normal in the morning and rising to 102° or so in the evening. (Fig. 3.)

Here you see the irregular course of the fever, and also that during the last few weeks of life the temperature falls several degrees below the normal line, showing the gradual extinction of the vital forces.

This then is a short description of this peculiar disease called sleeping sickness; and now the question arises, what is it that causes this peculiar disease, and gives rise to these curious symptoms? I may pass over without notice the various theories which have been held up to the present time to account for this disease, and ask your attention to what is revealed on a careful microscopical examination of the blood of these cases. If the blood

"Sleeping Sickness in Uganda"



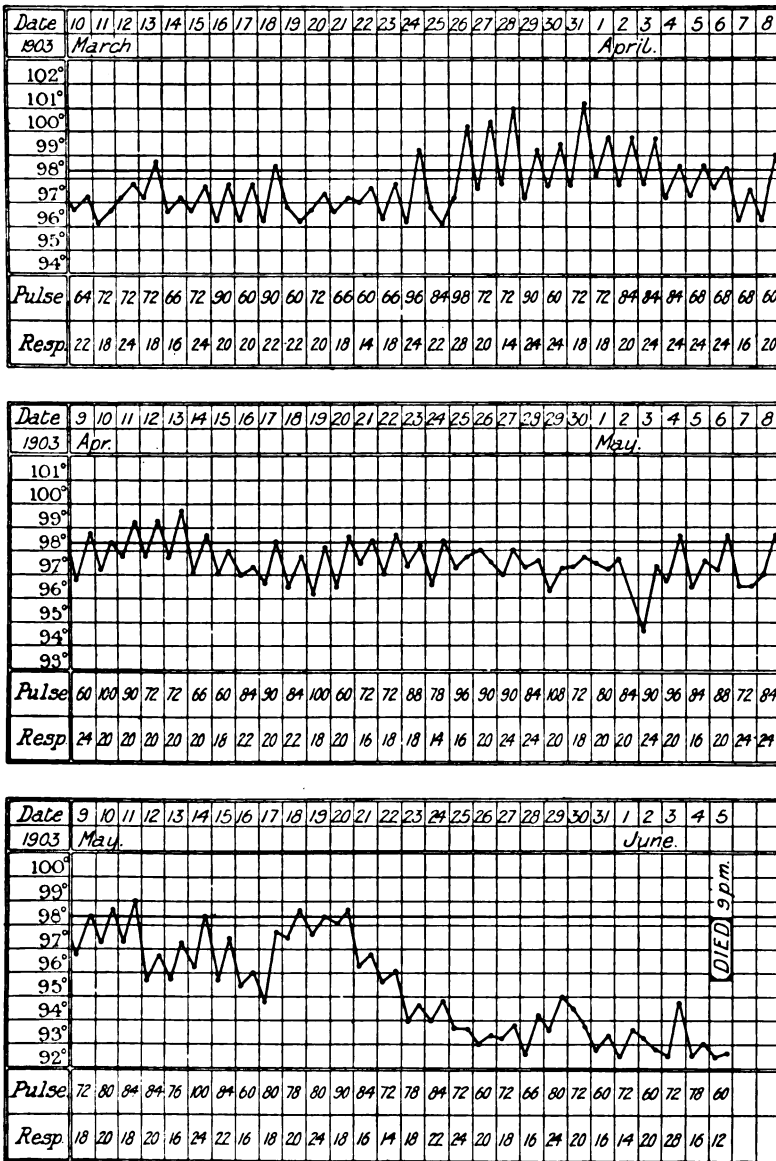


FIG. 3.

from a case of sleeping sickness is examined under a high power of the microscope, an active, wriggling parasite may be seen, which is known by the name of trypanosome.

Here is a representation of the trypanosome found in sleeping sickness :—



FIG. 4.—Blood Parasites.

These blood parasites belong to the lowest group in the animal kingdom, viz., the protozoa. The trypanosome consists of a single cell, and in its best known form is a sinuous, worm-like creature, provided with a macronucleus and a micronucleus, a long terminal flagellum, and a narrow fin-like membrane, continuous with the flagellum and running the whole length of the body. When alive it is extremely rapid in its motions, constantly dashing about, and lashing the red blood corpuscles into motion with its flagellum. It swims equally well with either extremity in front.

Among the first to draw attention to these blood parasites was the late Surg.-Major Timothy Lewis, F.R.S., R.A.M.C.; he discovered a trypanosome, in 1888, in the blood of rats in India, to

which was afterwards given the name of *Trypanosoma Lewisi*. This rat trypanosome is found all over the world, and even in Uganda the blood of the ordinary common wild field rat was often found to contain myriads of these creatures. This trypanosome does not appear to do any great harm, or to have any effect on the health of the rats. The next important trypanosome was found also in India, in the blood of horses suffering from surra. This disease, surra, is closely related to the tsetse fly disease of South Africa, or, as it is called by the natives, nagana.

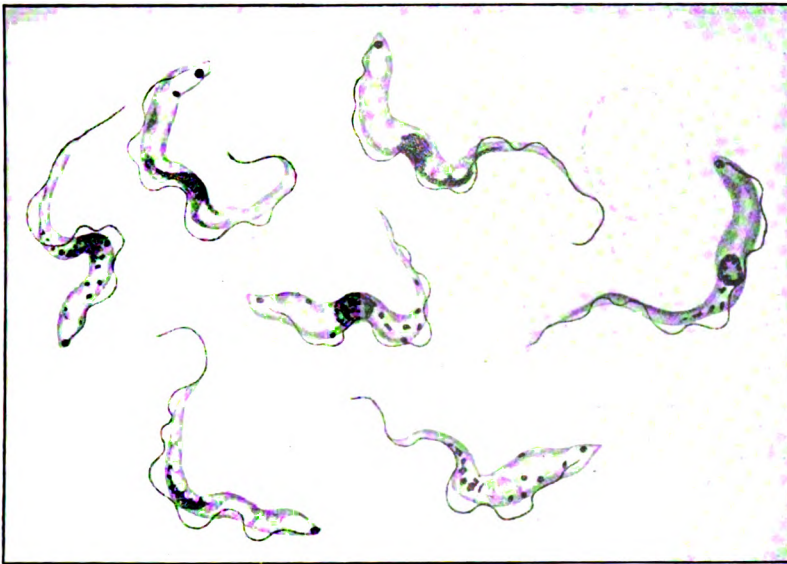


FIG. 5.—Blood of Sleeping Sickness Cases.

The trypanosome which causes tsetse fly disease lives in the blood of the wild animals, such as the buffalo and various antelopes, without evidently interfering with their health, but, when transferred by the tsetse fly from the blood of these wild animals to that of the domestic animals, it causes the death of the latter. Almost all the domestic animals are highly susceptible to nagana, especially horses, dogs and cattle, and even monkeys, but curiously enough man himself is insusceptible.

But now let us return to our examination of the blood of cases of sleeping sickness. The method of examination is simple: 10 c.c. of blood are drawn, by means of a hollow needle, from one of

the veins of the arm, and this is then centrifuged to get rid, as far as possible, of the red blood corpuscles. When this has been done the clear fluid is decanted off and again centrifuged, and the sediment now resulting is subjected to microscopical examination.

Date.	Name.	Sex.	Age.	Duration of disease.	Trypanosoma.
1903.					
Apr. 16 . . .	Benjamini	Male	28	1st stage	Present.
" 18 . . .	Esuka	"	28	1st "	"
" 18 . . .	Waiswa	"	10	1st "	"
" 18 . . .	Kidorme	"	20	2nd "	"
" 18 . . .	Zebuganza	"	40	1st "	"
" 18 . . .	Budara	"	22	2nd "	"
" 20 . . .	Kimbra	"	30	2nd "	"
" 20 . . .	Matasa	"	24	1st "	"
" 21 . . .	Seera	"	25	2nd "	Absent.
" 22 . . .	Warosansa	"	32	2nd "	Present.
" 22 . . .	Katola	"	25	1st "	"
" 27 . . .	Kongoffu	"	30	1st "	"
" 27 . . .	Kitaroma	"	20	1st "	"
May 12 . . .	Nakaiba	Female	8	1st "	"
" 12 . . .	Musa	Male	20	1st "	"
" 14 . . .	Diwarana	"	14	1st "	"

I draw your attention to this table giving the result of the examination of sixteen cases, and here you find that in every case, with the exception of one, this trypanosome is found. In all probability it would have been found in the sixteenth case if there had been opportunity for further examination, but the man unfortunately died before the trypanosomes had been discovered in his blood.

But there is another fluid in the body which is more easily examined than blood for such a small parasite, and that is the cerebro-spinal fluid.

This cerebro-spinal fluid is a clear transparent fluid, exactly resembling water in outward appearance, which fills the various cavities of the brain and surrounds the spinal cord so as to prevent damage to these delicate organs. It is easily obtained by introducing a hollow needle between the vertebræ in the lumbar region. Ten to fifteen cubic centimetres of the fluid are drawn off, which is then centrifuged and the sediment examined. As there are few or no red corpuscles in the fluid to interfere with vision, naturally the actively moving trypanosomes are more easily detected.

I now give a table showing the result of the examination of the cerebro-spinal fluid of cases of sleeping sickness.

Date.	Name.	Sex.	Age.	Duration of case.	No. of examination.	Trypanosoma.
1903.						
May 14	Kuperi.....	Male	8	3rd stage	1	Present.
Mar. 26	Seera	"	25	1st "	1	"
" 26	Budara	"	22	2nd "	1	"
" 26	Kimbra	"	30	2nd "	1	"
" 26	Kagoya	Female	20	3rd "	1	"
" 27	Zeboganza	Male	40	1st "	2	"
" 27	Yakubu	"	12	2nd "	1	"
" 28	Kidorme	"	20	2nd "	1	"
" 28	Leobeni	"	25	3rd "	1	"
" 29	Waiswa	"	10	1st "	1	"
" 31	Dekodemo	"	25	3rd "	1	"
Apr. 1	Fatoma	Female	18	1st "	2	"
" 6	Katola	Male	25	1st "	1	"
" 6	Esaka	"	28	1st "	1	"
" 6	Nakaiba	Female	10	1st "	1	"
" 6	Zakibu	Male	20	2nd "	1	"
" 6	Warosansa	"	32	2nd "	1	"
" 8	Jansi	"	25	1st "	1	"
" 9	Feragi	"	12	1st "	1	"
" 10	Katoola	"	20	1st "	1	"
" 10	Donah	"	38	1st "	1	"
" 10	Asumani	"	25	1st "	2	"
" 10	Kainavidi	"	20	1st "	1	"
" 10	Moosura Madunga	"	30	1st "	2	"
" 10	Msabwa	"	30	1st "	1	"
" 10	Adam	"	30	2nd "	1	"
" 13	Nonbi	Female	30	1st "	2	"
" 13	Benjamini	Male	24	1st "	5	"
" 13	Kiagoffu	"	30	1st "	1	"
" 13	Kitaroma	"	20	1st "	1	"
" 14	Nateneri	"	25	1st "	1	"
" 14	Mutaisa	"	15	1st "	1	"
" 14	Eriasa	"	20	1st "	1	"
" 14	Bagwibwa	Female	18	1st "	1	"
" 14	Johana	Male	20	1st "	1	"
" 14	Mwasa	Female	18	1st "	1	"
" 14	Bukina	Male	25	2nd "	1	"
" 20	Matasa	"	24	1st "	4	"
May 4	Kiagabidoia	"	50	1st "	5	"
" 14	Divarana	"	14	1st "	1	"

Here, as you see, forty have been examined and the trypanosomes found in every one. This is rather suggestive fact, and it begins to appear that these patients may have some causal relationship to the disease.

But it may be that the disease is a mental concomitant of the disease, like blood and spinal fluid without affecting the blood in the same way as the rat

trypanosome lives in rats, or the nagana trypanosome in the wild animals. So it may be that natives suffering from other diseases also harbour these trypanosomes in their cerebro-spinal fluid. To find out if this were so we must examine the cerebro-spinal fluid of natives who come into hospital for other complaints than sleeping sickness. The following table shows the result of the examination of the cerebro-spinal fluid of fifteen cases, and here the trypanosomes are absent in every case.

Date.	Name.	Sex.	Age.	Locality.	Trade.	Disease.	Trypano-soma.
1903.							
Mar. 24	Landu	M.	..	Hospital	Marine	Suppurating fem. glands	Absent.
" 30	Zake	M.	25	"	Patient	Swelling under pectoralis	"
" 30	Icongo	M.	..	"	"	"	"
" 30	Pio	M.	12	"	"	Fracture	"
" 30	Kapere III.	M.	25	"	"	Itch	"
" 30	Eliza	F.	18	"	"	Yaws	"
" 31	Bofralour	M.	16	"	"	Pleuritis	"
" 31	Zanabu	F.	30	"	"	Headache	"
Apr. 1	Nabujam	F.	45	"	"	Cerebral tumour	"
" 8	Kamsa Mahomed	M.	25	"	"	Madura foot	"
" 23	Daudi.	M.	..	Entebbe	Prisoner	Patient in civil hospital	"
" 24	Nathaniel	M.	..	Hospital	Patient	Not diagnosed	"
" 29	Arkadi	M.	..	"	"	Suppurating bubo	"
May 8	Matca	M.	..	"	"	Circumcision	"
" 6	Kavera.	M.	..	"	"	Rheumatism	"

But now, having seen that this trypanosome is found in the blood and cerebro-spinal fluid of all cases of sleeping sickness, and that it is not found in the cerebro-spinal fluid of natives suffering from other diseases, let me ask you to consider that in a slow and chronic disease such as this, sometimes taking years to develop, there must be many natives living in the sleeping sickness area who have these trypanosomes in their blood without as yet showing any manifest symptoms of the disease. This seems to be an important point, because if this trypanosome is in reality the cause of sleeping sickness, a certain proportion of the natives inhabiting the sleeping sickness area ought to harbour these parasites in their



FIG. 6.—Sick monkey.



blood. On the other hand, if this parasite is the true cause of this disease, then no native living in a non-sleeping sickness area ought to harbour a single trypanosome in his blood. It will, therefore, be interesting to examine the blood of natives in the sleeping sickness area and the non-sleeping sickness area of Uganda. Further, it will act as a check if we examine natives living in a non-sleeping sickness area, say in Nairobi, in British East Africa, which is some hundreds of miles away from any infected place. (See Tables A, B and C.)

Eighty natives from the sleeping sickness area were examined with the result that twenty-three were found to have trypanosomes in their blood, giving a percentage of 28.7. One hundred and seventeen were examined from non-sleeping sickness areas, but not a single trypanosome was found.

You will all agree with me that these results make it very highly probable that the trypanosome under discussion is the real cause of this disease; but there are other methods of adding to this proof, for example, by experiments on animals. If this trypanosome gives rise to symptoms of sleeping sickness in one of the lower animals, this will be a great addition to the proof that this parasite is the cause of sleeping sickness.

The best animals procurable in Entebbe for the purpose of animal experimentation are monkeys. The infective material is injected under the skin, into the spinal canal, and also into the cavity of the brain. The animals show no symptoms for a long time; their temperature remains absolutely normal, and they appear to be in perfect health, but after some months fever of an irregular type sets in and the animals begin to show symptoms of lethargy, sitting about all day, and taking very little interest in their surroundings. Towards the end they sit all day long with their heads bent on their chests, apparently asleep, and show a strong resemblance to the later symptoms of the disease in man.

During this time the monkeys show, constantly, trypanosomes in their blood, sometimes in fairly large numbers.

Fig. 6 is a photograph of one of these sick monkeys.

Therefore it is shown that the trypanosomes derived from cases of sleeping sickness give rise to a long chronic disease in the monkey with symptoms closely resembling those seen in man. From these animal experiments, taken in connection with the other observations, we may now assert that these trypanosomes are the cause of sleeping sickness.

Incidence of Trypanosomes in the Blood of General Population.

A.—Sleeping Sickness Area.

Date.	Name.	Age.	Sex.	District.	Shamba.	Name of Chief.	Trypanosoma	Filaria.
June 12 ..	Wagononye..	25	M.	Sese Island	Sewana	—	+	+
" 13 ..	Zamala ..	20	M.	"	Kaganda Island	—	+	+
	Sibolyamba..	25	M.	"	Kaganda Island, Malanga ..	—	+	+
	Lusaka ..	30	M.	"	Kaganda Island, Bubeke ..	—	—	+
	Byasi ..	20	M.	"	Semagala Island, Busendeni ..	Serumaga	—	+
	Nalyonzi ..	25	M.	"	Buvovu Island, Kasange ..	Nokuba	—	+
	Sagala ..	25	M.	"	Kaganda Island, Bukasa ..	Kaganda	—	+
" 16 ..	Paulo ..	20	M.	"	Semagala Island, Dajs ..	Bugambi	—	+
	Luwercheti..	30	M.	"	Buvu Island ..	Namamba	—	+
	Balyokwakwe	35	M.	"	Semagala Island, Burigo ..	Kakobogo	—	—
	Kapere ..	20	M.	"	" " Busowa ..	Sawadu	—	—
	Kewaza ..	40	M.	"	" " Bungo ..	Kakobogo	—	+
	Takirambala	40	M.	"	Lubamba Island, Imperja ..	Sabawabe	—	—
	Gumira ..	25	M.	"	Bugaba Island ..	Bugu	+	+
	Kitungula ..	35	M.	"	Semagala Island, Buswa ..	Keozekia	+	—
	Tevamukopi	25	M.	"	Bunani Island ..	Buvaro	+	+
" 18 ..	Kajerero ..	25	M.	"	Buninga Island ..	Savawan	+	+
	Zwaki ..	23	M.	"	Kome Island ..	—	+	+
	Nutaba ..	24	M.	"	Bugaba Island ..	—	+	+
" 19 ..	Nmmugula ..	25	M.	"	Sewala Island ..	—	+	+
" 23 ..	Sibaganga ..	30	M.	"	Busi Island ..	Mugema	+	—
	Tangamalala	25	M.	"	Bulenge	Rasto	+	+
	Nassajage ..	30	M.	"	"	"	+	+
	Tabula ..	10	M.	"	"	"	—	+
" 27 ..	Mundu ..	25	M.	"	"	"	+	+
	Mundu ..	20	M.	"	"	Mugema	+	+
	Buza ..	30	M.	"	"	"	+	+
	Sabakake ..	20	M.	"	"	"	—	+
	Bagamatuba	30	M.	"	"	"	+	+
" 8 ..	Nangibwa ..	30	M.	"	"	"	—	+
" 13 ..	Magwanjamba	40	M.	"	"	"	+	+
	Rotate ..	45	M.	"	Nkumba	Sebugwa	—	+
	Jungubense	25	M.	"	"	"	—	+
	Mucase ..	25	M.	"	"	"	+	—
	Sefebedi ..	40	M.	"	"	"	—	—
	Mundu ..	30	M.	"	"	"	—	+
" 19 ..	Kikocharvasi	35	M.	"	"	"	—	—
	Petero ..	20	M.	Entebbe	Ugonga	—	—	—

June 19 ..	Sibasoboke ..	30	M.	Bussi Island	Gombe	..	..	..	Mugema	..	+
" 20 ..	Arikisi ..	40	M.	Magema	Mugema	..	..	..	Sebugwao	..	+
	Antonio ..	20	M.	"	"	..	..	..	"	..	-
	Kiguaku ..	30	M.	"	"	..	..	..	"	..	-
	Brahmi ..	25	M.	"	"	..	..	..	"	..	-
	Musoke ..	14	M.	"	"	..	..	..	Sebanji	..	-
	Daniel ..	12	M.	"	"	..	..	..	"	..	-
	Balumedeni ..	20	M.	"	"	..	..	..	"	..	-
	Semone ..	20	M.	"	"	..	..	..	Mugema	..	+
	Muagazi ..	30	M.	"	"	..	..	..	Sebanja	..	+
	Nyasi ..	12	M.	"	"	..	..	..	Mugema	..	-
" 22 ..	Saulo ..	18	M.	"	"	..	..	..	"	..	+
	Zake ..	20	M.	"	"	..	..	..	"	..	+
	Kalulwe ..	40	M.	Eutebbe	Kigungu	..	..	..	Mugula	..	+
	Kakulwana ..	18	M.	"	"	..	..	..	Wasanye	..	+
" 22 ..	Zirimanye ..	18	M.	"	"	..	..	..	Mugula	..	-
	Danielli ..	16	M.	"	"	..	..	..	Batende	..	-
	Daudi ..	20	M.	"	"	..	..	..	Kalunga	..	+
	Bafirawara ..	16	M.	"	"	..	..	..	Mugula	..	-
	Mutesenda ..	20	M.	"	"	..	..	..	"	..	-
	Lugwana ..	18	M.	"	Kabale	..	..	..	Sebugwao	..	-
	Gabula ..	20	M.	"	Policeman	..	..	..	"	..	-
March 12 ..	Karala Barigi ..	—	M.	"	"	..	..	..	—	..	+
" 28 ..	Kumsarsabba ..	—	M.	"	Prisoner	..	..	..	—	..	-
" 31 ..	Jordien Murjan ..	—	M.	"	Marine	..	..	..	—	..	+
April 15 ..	Tabula ..	—	M.	"	Policeman	..	..	..	—	..	+
" 21 ..	Bara Risgallah ..	—	M.	"	Prisoner	..	..	..	—	..	-
" 23 ..	Airara ..	—	M.	"	"	..	..	..	—	..	-
" 24 ..	Biggity ..	—	M.	"	Hospital	..	..	..	—	..	-
" 28 ..	Nathaniel ..	—	M.	"	"	..	..	..	—	..	-
" 29 ..	Aradiki ..	—	M.	"	"	..	..	..	—	..	-
" "	Chia Msoga..	—	M.	"	"	..	..	..	—	..	-
	Arkadi ..	—	M.	"	"	..	..	..	—	..	-
	Maudandiki ..	—	M.	"	"	..	..	..	—	..	-
May 6 ..	Jumabini ..	—	M.	"	"	..	..	..	—	..	-
" 8 ..	Matea ..	—	M.	"	"	..	..	..	—	..	-
" 13 ..	Bifarawala ..	—	M.	"	Prisoner	..	..	..	—	..	-
" 16 ..	Amuri Abdulla ..	—	M.	"	"	..	..	..	—	..	-
" 18 ..	Serewame ..	—	M.	"	"	..	..	..	—	..	-
" 21 ..	Juma Bin Abdulla..	—	M.	"	"	..	..	..	—	..	-
" 22 ..	Baraca Bin Salimi..	—	M.	"	"	..	..	..	—	..	-
April 2 ..	J. M. ..	—	M.	"	Hospital	..	..	..	European	..	+

Incidence of Trypanosomes in the Blood of General Population.
B.—Non-Sleeping Sickness Area, Uganda.

Date.	Name.	Age.	Sex.	District.	Shamba.	Name of chief.	Trypano- soma.	Filaria.
June 2.....	Wagalla	40	M.	Kampala .....	..	..	-	+
	Zemndari	20	M.	" .....	..	..	-	+
	Mutakanya	25	M.	" .....	..	..	-	-
" 3.....	Suziga	20	M.	" .....	..	..	-	-
	Burrigardi	30	M.	Toro.....	Kaina.....	..	-	-
	Ntaragi	40	M.	Makota	5 days N. of Kampala..	..	-	-
	Bassaga	15	M.	" .....	" .....	..	-	-
" 4.....	Kilongazi	50	M.	Jalumba	Near Makota .....	..	-	-
	Kianju	40	M.	Buganga .....	..	..	-	-
	Nsali	40	M.	"	Matiana .....	..	-	-
	Jagenda	35	M.	Singo .....	..	..	-	-
	Sengova	30	M.	Buganga .....	..	..	-	-
	Kidormori	30	M.	Nakolia .....	..	..	-	+
" 5.....	Bagnsagera	25	M.	" .....	..	..	-	-
	Luganda	20	M.	Kalagala .....	..	..	-	-
	Birija	35	M.	Matuntotora .....	..	..	-	+
	Kagama	45	M.	" .....	..	..	-	+
	Kasoka	35	M.	Kibali .....	..	..	-	-
" 8.....	Bulabiki	40	M.	Kiwangole .....	..	..	-	-
" 10.....	Kongura	35	M.	Kikanda .....	..	..	-	-
	Watagana	35	M.	Bulenwezi	Busibika .....	..	-	-
	Karimuemba	40	M.	Kalagala	Kalagala .....	..	-	-
	Watesaka	20	M.	Bulenwezi	Sambwao .....	..	-	+
	Matamburire	35	M.	"	Busindi.....	..	-	-
	Roukiaju	30	M.	"	Sambwao .....	..	-	+
	Kaisi	40	M.	" .....	" .....	..	-	+
" 11.....	Guutude	25	M.	Mawokota	Kaniki .....	..	-	-
	Murianzeki	30	M.	" .....	" .....	..	-	+
	Tandamuwaka	30	M.	" .....	" .....	..	-	+
	Banegwira	30	M.	" .....	" .....	..	-	+
	Basaga	30	M.	" .....	" .....	..	-	+
	Munyowa	35	M.	" .....	" .....	..	-	+

Non-Sleeping-Sickness Area, Uganda—continued.

Date.	Name.	Age.	Sex.	District.	Shamba.	Name of chief.	Trypano- soma.	Filaria.
June 12	Kwaratuli	45	M.	Buddu	Masaka .....	..	-	+
	Kyalwazi	45	M.	" .....	" .....	..	-	+
	Byempulidi	40	M.	" .....	" .....	..	-	+
	Ganantawa	40	M.	" .....	" .....	..	-	+
" 15.....	Sibugwera	25	M.	"	Dinnu ? .....	..	-	+
	Kubolikoza	20	M.	Mawokota	Katima	Rutalo	-	+
	Samukotu	30	M.	"	Kabire	Muhaia	-	-
	Muogozzi	25	M.	"	Kagenda	Kagenda	-	+
	Munda	30	M.	"	Donda	Muquerwa	-	+
	Bamutarye	45	M.	"	Katima	Dukadvi	-	+
" 17.....	Mitickula	25	M.	"	Kango	Kabodyi	-	+
	Kida	25	M.	Busiro	Luoka	Mukulu	-	+
	Zaumbatise	25	M.	"	Kiengaza	"	-	+
	Ibu	25	M.	"	Luoka	"	-	+
	Zinazi	20	M.	"	Kisiba	Kasola	-	+
	Takaridia	20	M.	Singo	Bujonkola	Kajongolo	-	-
	Malugyo	20	M.	"	Kagambi	Mbugano	-	-
	Balirawala	20	M.	"	Kalungu	Mutesa	-	-
	Buzibwa	20	M.	"	Kireha	Kikwabanga	-	-
" 18.....	Nume	35	M.	Busiro	Kagenbe	Mukwenda	-	+
	Kirimentao	40	M.	Unyoro	Butanja	Kimbaranga	-	-
	Tamanya	40	M.	"	"	"	-	-
	Makogoto	40	M.	"	Kikumbia	"	-	-
	Subagabu	25	M.	"	Seresi	Muresesi	-	-
	Lukala	25	M.	"	Pachwa	Kimbaranga	-	-
	Koweni	25	M.	"	Bubangu	Kasoro	-	-
	Kahirebu	35	M.	"	Butanja	Kimbaranga	-	-
	Rukubywa	40	M.	"	Pachwa	"	-	-
	Kieka	20	M.	"	"	Peteri	-	-
" 19.....	Murumbia	30	M.	"	"	"	-	+
	Zezetu	25	M.	Bulenwezi	Kaswa	Kasiba	-	-
	Katagu	18	M.	Buddu	Kagandu	Kakenbo	-	-
	Mukasa	14	M.	Busiro	Maganja	Muduauliba	-	-
	Name unknown	20	M.	(?)	(?)	Bruci	-	-

"Sleeping Sickness in Uganda"

Incidence of Trypanosomes in the Blood of General Population.

C.—Non-Sleeping Sickness Area, Nairobi, British East Africa.

(Examined by Capt. Greig, I.M.S., and Dr. Wiggins.)

Date.	Name.	Occupation.	District.	Trypanosoma.	Filaria.
July 14 ..	Sinandi	Askaris ..	Masai	—	—
	Gila	"	"	—	—
	Massina	"	"	—	—
	Barugo	"	"	—	—
	Matolo	"	"	—	—
" 15 ..	Nandi	"	"	—	—
" 15 ..	Tomana	"	"	—	—
	Rosani	"	"	—	—
	Rosi	"	"	—	—
	Lendiana	"	"	—	—
	Gingili	"	"	—	—
" 16 ..	Rangue	"	"	—	—
	Kabode	"	"	—	—
	Kamia	"	"	—	—
	Tabangi	"	"	—	—
" 17 ..	Karmongi	Labourer	Kukuyu ...	—	—
	Yurimgo	"	"	—	—
	Girewamatwo	"	"	—	—
	Katono	"	"	—	—
	Gomi	"	"	—	—
	Kayaro	"	"	—	—
18 ..	Ati	Prisoner	"	—	—
" 20 ..	Gmosi	"	"	—	—
	Luwi	"	"	—	—
	P	"	Masai	—	—
	Nana	"	"	—	—
	Seri	"	"	—	—
	Goma	"	"	—	—
" 20 ..	Kinare	"	"	—	—
	Mahone	"	Kukuyu ...	—	—
" 21 ..	Masagai	"	Masai	—	—
	Desa	"	"	—	—
	Muenda	"	"	—	—
	Morandat	"	"	—	—
	Joke	"	Wakamba ..	—	—
	Waweme	"	Masai	—	—
	Zabe	"	Wakamba ..	—	—
	Kalango	"	Kukuyu ...	—	—
	Harya	"	"	—	—
" 22 ..	Nabo	Askaris ..	Masai	—	—
	Lgina	"	"	—	—
	Kisikas	"	"	—	—
	Mandasingere	"	"	—	—
	Magome	"	"	—	—
	Longotoematabut ..	"	"	—	—
	Gomi	"	"	—	—
	Lulgini	"	"	—	—
	Zeru	Labourer	Kukuyu ...	—	—
	Jarogo	"	"	—	—
	Kanosi	"	"	—	—

part of Uganda can a single case be found more than a few miles from the lake shore. This part of the country, the islands and the shore of the lake, is, however, the most thickly populated, there being here a population of more than a 100 to the square mile. In this area since 1901 the disease has raged, and many places have become depopulated.

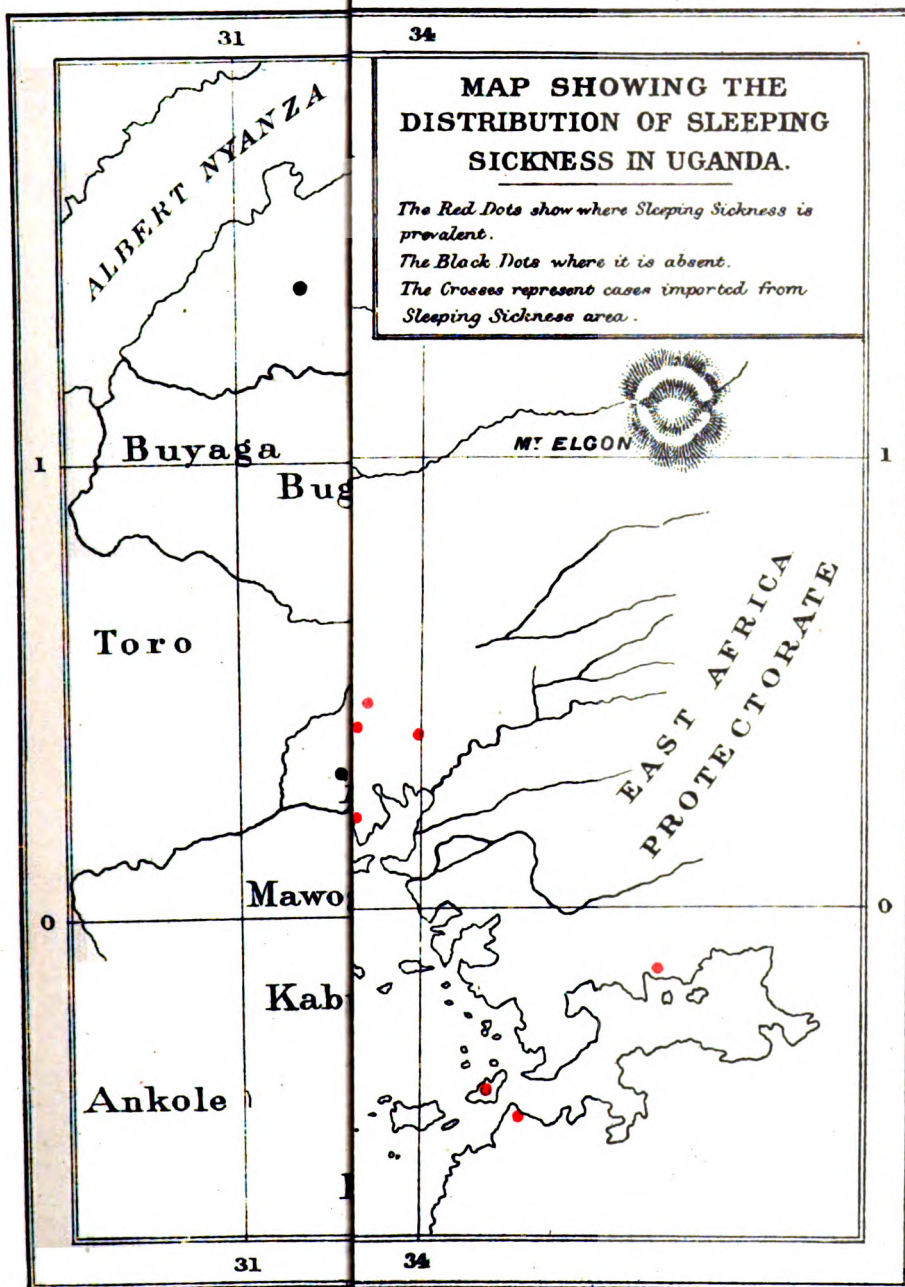
In Busoga, where, as we saw, the disease first broke out, cases are found further inland than in Uganda, but here also the same rule holds good. As Mr. Cubbitt, Assistant Collector in Busoga, wrote: “It would seem to be a fairly accurate statement to make, that sleeping sickness confines itself to the territories adjoining the lake, roughly speaking, from a ten to twenty mile radius of the coast.” The Uganda Prime Minister, Apolo, also gives it as his opinion that a strip along the lake shore, ten miles broad, would cover the infected area, and that any cases found further inland are always imported cases. The islands have been specially affected by the disease. For example, the Island of Bavuma in 1901 had a population of 22,000; in 1903 only 8,000 remained alive.

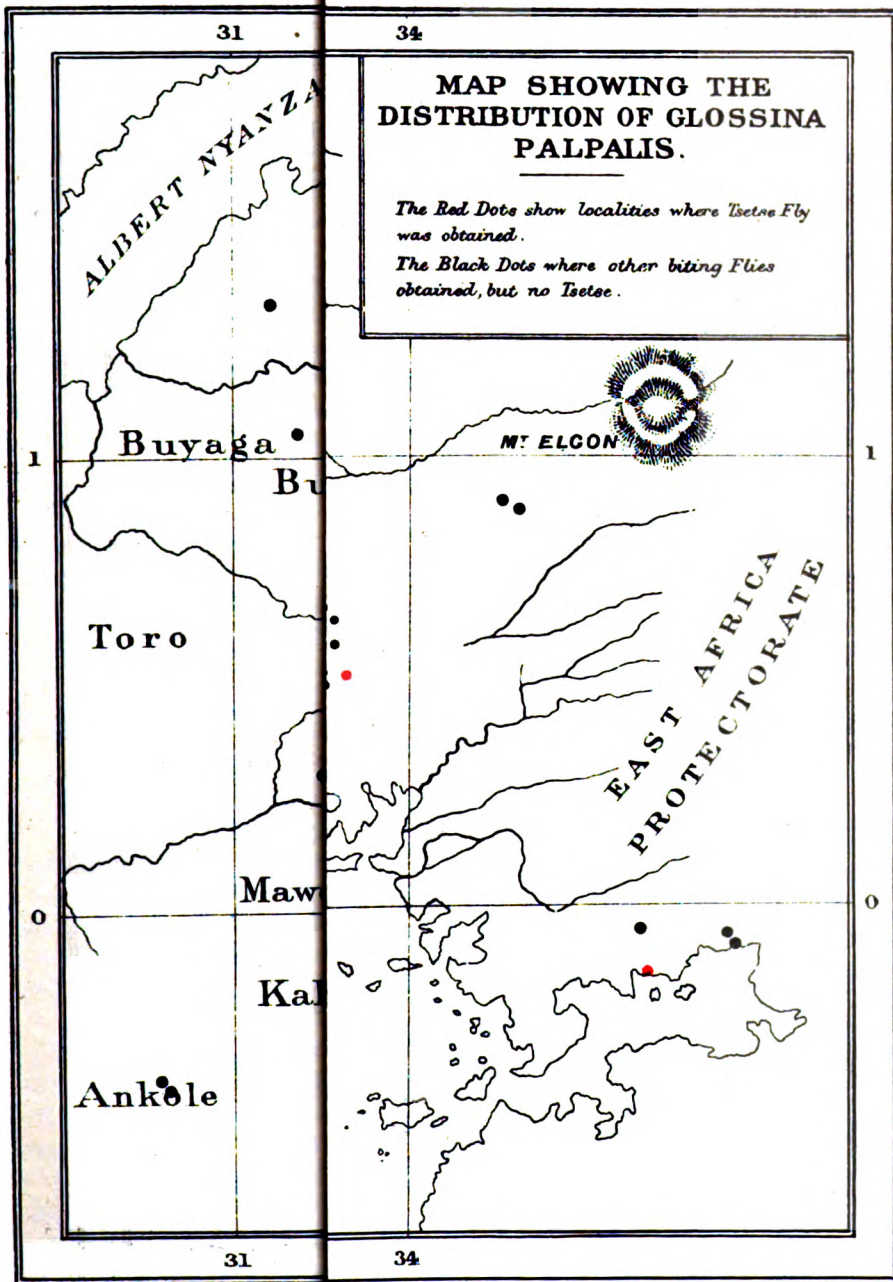
Now there must be some cause for this peculiar distribution. Sleeping sickness, evidently, cannot be due to a food poison, as has been suggested, since the people living outside the sleeping sickness strip eat the same food, and have the same habits as those living on the lake shore.

Then again, we have found that the cause of the disease is a trypanosome, a blood parasite, which is not likely to be conveyed in food or clothes, or directly from man to man, but most probably must be carried by some blood-sucking insect.

This leads to the question: “Does the distribution of sleeping sickness in Uganda coincide with the distribution of any particular biting insect?”

Knowing that we are dealing with a trypanosome, and knowing that the trypanosome of Nagana is carried in South Africa by a tsetse fly (*G. Morsitans*), naturally we will suspect that the trypanosome of this disease is also carried by a tsetse fly. Now on the lake shore near Entebbe a tsetse fly (*G. Palpalis*) is found in large numbers. This may be the insect carrier we are in search of. The Prime Minister and Regents, on being consulted, recognised the fly as one known to the Muganda as the Kivu, and said it was found along the shores of the lake. They were supplied with several dozen nets, killing bottles and boxes, and on their part promised to have the distribution of this fly and of sleeping sickness worked out. The bishops, missionaries, and Government officials also promised their assistance.





During June, July and August of last year some 460 collections of biting flies were sent in from all parts of Uganda. As each package came in it was examined for tsetse flies. If the parcel contained one or more tsetse flies, a red disc was stuck on a large map over the locality from which the flies had been sent. If, on the other hand, no tsetse flies were found, a blue disc was fixed over the spot.

In the same way and at the same time a second map was prepared, to show the distribution of sleeping sickness. That is to say, if the note accompanying the collection of flies stated that sleeping sickness was prevalent, then a red disc was placed over the locality, and if, on the contrary, no cases of sleeping sickness were reported, a blue disc was affixed.

It is evident that two maps so prepared should show at a glance whether the distribution of sleeping sickness and this tsetse fly corresponds or not.

The accompanying maps are prepared from these two maps. On comparing them the similarity of the distribution of sleeping sickness and *Glossina palpalis* is self-evident.

In order to work out more minutely the habits of the *Glossina palpalis*, the peninsula on which Entebbe stands was taken in detail and carefully searched for the fly.

The result of this showed that the fly is only found on the shore of the lake where there is forest. This forest is thick jungle with high trees and dense undergrowth. The fly is never found on open sandy beaches backed by grass plains, even although there may be some small scrub near the water's edge. It is never found in the grass of the grassy plains, even though the grass be long and tangled. It has not been found by us in banana plantations, and not at any time far from the lake shore.

The habitat, then, of this fly is the shore of the lake where there is forest. In Busoga, on the other hand, it appears to be found further inland, but what the physical characters of this province are which would account for this I have not learnt. The fly also passes down the Nile as far as Kakoge Ferry, some 50 miles north of the Ripon Falls, and it has even been received from Fajao on the Somerset Nile, and from Tengri and the Achwa River, still further north and near Wadelai, and also from Lake Albert.

It is important that the distribution of this fly should be fully worked up, but enough has been done to show that the distribution of this species of tsetse fly is, like sleeping sickness, confined to the shores of the lake and the islands. It is on the densely-wooded

EXPERIMENT 114.—Monkey (*Cercopithecus* sp.).

Feeding tsetse flies on a healthy monkey 8 hours after they had been fed on a Sleeping Sickness patient.

Date.	Number of flies fed on—		Trypano- somes.	Date.	Number of flies fed on—		Trypano- somes.
	Patient.	Monkey.			Patient.	Monkey.	
May—				June—			
20	22	0	Absent	22	16	2	Absent
22	4	5		23	24	14	
23	11	2	Absent	24	31	10	
23	9	7		25	25	17	
24	9	6		26	28	8	
25	15	1		27	17	15	
26	10	4		28	0	0	
27	6	5		29	26	26	
28	8	7		30	24	22	
29	5	4					
30	9	3		July—			
31	5	1		1	18	15	Absent
June—				2	29	16	
1	1	9	Absent	3	28	11	
2	6	2		4	27	14	
3	8	1		5	19	13	
4	4	2		6	31	16	
5	4	3		7	32	11	
6	5	5		8	23	13	
7	0	0		9	12	15	
8	13	9		10	14	0	
9	8	4		11	14	28	
10	9	5	Absent	12	28	6	
11	10	6		13	22	18	
12	8	5		14	19	12	
13	9	6		15	18	8	
14	0	0		16	17	13	
15	4	12		17	24	9	Absent
16	8	10		18	20	8	
17	2	1		19	12	11	
18	2	5		20	23	17	
19	7	4		21	16	13	
20	5	4		22	17	11	
21	0	0		23	Present

EXPERIMENT 115.—Monkey (*Cercopithecus* sp.).

Feeding tsetse flies on a healthy monkey 8 hours after they had been fed on a Sleeping Sickness patient.

Date.	Number of flies fed on—		Trypanosomes.	Date.	Number of flies fed on—		Trypanosomes.
	Patient.	Monkey.			Patient.	Monkey.	
May—				June—			
20	12	0	Absent	22	29	9	Absent
21	0	3		23	18	9	
22	10	2	Absent	24	21	21	
23	6	1		25	23	14	
24	7	2		26	17	6	
25	11	5		27	16	9	
26	8	4		28	0	0	
27	11	1		29	33	27	
28	6	3		30	28	21	
29	9	8		July—			Absent
30	9	4		1	22	17	
31	9	3		2	22	19	
June—				3	21	13	
1	2	9	Absent	4	24	10	
2	9	7		5	33	10	
3	5	2		6	33	10	
4	6	4		7	29	12	
5	2	3		8	10	16	
6	8	7		9	10	12	
7	0	0		10	16	13	
8	4	10		11	6	18	
9	5	4		12	29	8	
10	5	4	Absent	13	18	11	
11	9	5		14	14	9	
12	2	7		15	18	12	
13	3	3		16	18	7	
14	0	0		17	30	7	Absent
15	6	12		18	35	17	
16	12	12		19	28	8	
17	7	2		20	30	8	
18	14	2		21	25	7	
19	4	2		22	21	14	
20	3	4		23	..	..
21	0	0					Present

EXPERIMENT 99. Monkey *Cercopithecus* (sp.).

Feeding tsetse flies on a healthy monkey 24 hours after they had been fed on a Sleeping Sickness patient.

Date.	Number of flies fed on—		Trypano- somes.	Date.	Number of flies fed on—		Trypano- somes.
	Patient.	Monkey.			Patient.	Monkey.	
May—				June—			
15	16		Absent	19	..	12	Absent
16	..	7		20	15		
17	6			21	..	0	
18	..	6		22	..	11	
19	16			23	21		
20	..	3		24	..	23	
21	12	2		25	26	..	
22	..	5		26	..	20	
23	9			27	19		
24	..	7		28	..	10	
25	5			29	52		
26	..	8		30	..	46	
27	11						
28	..	5	Absent	July—			Absent
29	7	..		1	15	..	
30	..	9		2	..	20	
31	6			3	31		
				4	..	45	
June—				5	27		Absent
1	..	7	Absent	6	..	27	
2	9			7	40		
3	..	6		8	..	17	
4	5			9	15		
5	..	4		10	..	15	
6	8			11	15		
7	..	0		12	..	21	
8	10			13	27		
9	..	6		14	..	28	
10	17			15	21		
11	..	18		16	..	24	
12	18			17	23	..	
13	..	17		18	..	23	
14	0			19	36		
15	8			20	..	16	
16	..	11		21	26		
17	0		Absent	22	..	29	Present
18	10	..		23	..	..

EXPERIMENT 116.—Monkey (*Cercopithecus* sp.).

Feeding tsetse flies on a healthy monkey 48 hours after they had been fed on a Sleeping Sickness patient.

Date.	Number of flies fed on—		Trypano- somes.	Date.	Number of flies fed on—		Trypano- somes.
	Patient.	Monkey.			Patient.	Monkey.	
May—				June—			
20	10	..	Absent	22	19		
21				23			
22	..	10		24	..	15	
23				25	..	..	Absent
24	9			26	26		
25				27			
26	..	5		28	..	16	
27	9			29	9		
28				30			
29				July—			
30	..	6	Absent	1	..	49	
31				2			
June—				3	51	..	Absent
1	6			4			
2				5	..	29	
3	..	7		6			
4	..	..	Absent	7	40		
5	11			8			
6				9	..	20	
7	..	4		10			
8				11	25		
9	6			12			
10				13	..	26	
11	..	7	Absent	14			
12				15	25		
13	16			16			
14				17	..	16	Absent
15	..	8		18			
16				19	64		
17	17			20			
18	11	..	Absent	21	..	46	
19				22			
20	..	3		23	..	..	Present
21							

shore of the lake that the half-naked natives of the mainland and islands meet in thousands to trade in fish, bananas, earthenware, &c. If the *Glossina palpalis* can act as a carrier of the trypanosome of sleeping sickness, the circumstances could not be made more favourable than they are for the spread of the disease.

The next point, therefore, to solve is: "Can this tsetse fly carry this trypanosome from persons suffering from sleeping sickness to healthy animals?"

The best animal to carry out these experiments on, of course, is the monkey. The method used is simply to feed tsetse flies on a sleeping sickness case, and, at varying intervals of time, to place the same cage of flies on a monkey. The sleeping sickness patients do not seem to feel the bites of the flies, as they make no complaints or other signs of inconvenience. It is convenient to have, as a rule, about 30 flies in each cage, but only those which fill themselves are to be reckoned as having fed. The tables on pp. 36-39 show the result.

This proves that this tsetse fly can convey the infection from the sick to the healthy. But as 28 per cent. of the natives of the sleeping sickness area have this trypanosome in their blood, doubtless the tsetse flies caught in this area, which feed on these natives, will be able to convey the disease to a healthy animal without any artificial feeding.

Let us, therefore, try what will be the effect of catching the ordinary wild tsetse flies and placing them straightway on healthy monkeys. This is a very crucial experiment, and the following table gives the result:—

EXPERIMENT 94.—Monkey (*Cercopithecus* sp.).

To ascertain if tsetse flies, freshly caught in the vicinity of Entebbe, are carrying trypanosomes.

May 13, 1903.				No trypanosomes.				No malaria.			
May 13	..	..	..	Fed 31 flies	May 19	..	..	..	Fed 20 flies.		
				freshly caught near Entebbe.	" 20	..	..	..	" 13 "		
" 15	..	..	..	Fed 15 flies.	" 21	..	..	..	" 16 "		
" 18	..	..	..	" 10 "							
				Blood examined.							
				Trypanosoma absent.					Malaria absent.		
May 22	..	..	..	Fed 20 flies.	May 25	..	..	..	Fed 31 flies.		
" 23	..	..	..	" 25 "	" 26	..	..	..	" 18 "		
" 24	..	..	..	" 17 "	" 27	..	..	..
				Blood examined.							
				Trypanosomes present.					Malaria absent.		

EXPERIMENT 130. Monkey (*Cercopithecus* sp.).

To note the effect of feeding freshly-caught tsetse flies on a healthy monkey.

June 10, 1903	..	..	..	Fed 60 freshly-caught flies.
" 11 "	..	..	..	" 23 flies.
				Blood examined.
				Trypanosomes absent.
				Malaria present.

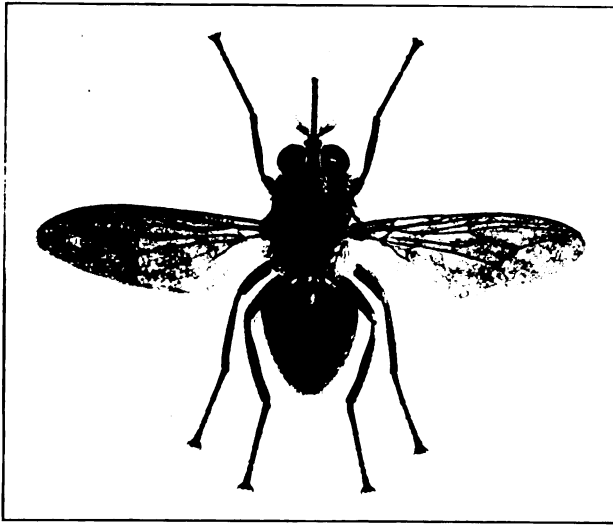


FIG. 7.—*Glossina palpalis*, Rob. Desv., ♂. ($\times 3\frac{3}{4}$).¹

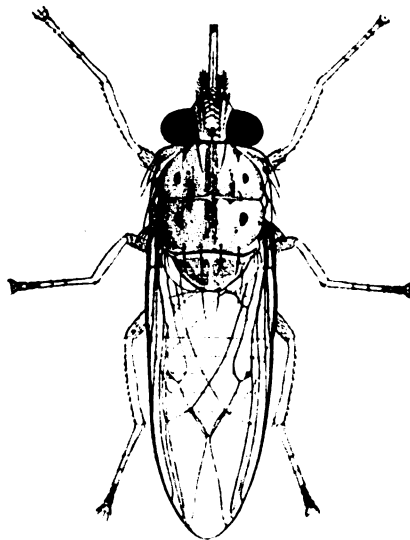


FIG. 8.—A Tsetse fly (*Glossina longipennis*, Corti, from Somaliland) in resting attitude, showing the position of the wings. ($\times 3\frac{1}{2}$).¹

¹ These two illustrations are taken from "A Monograph of the Tsetse flies," by Ernest Edward Austen, British Museum (Natural History), Cromwell Road, S.W.

June 12	..	..	..	Fed 12 flies.	June 17	..	..	..	Fed 25 flies.
" 13	..	..	..	" 26 "	" 18	..	..	..	" 10 "
" 14	..	..	..	" 20 "					
				Blood examined.				Trypanosomes absent.	Malaria present.
June 19	..	..	..	Fed 9 flies.	June 23	..	..	..	Fed 74 flies.
" 20	..	..	..	" 19 "	" 24	..	..	..	" 31 "
" 21	..	..	..	" 30 "	" 25	..	..	..	" 28 "
" 22	..	..	..	" 7 "					
				Blood examined.				Trypanosomes absent.	Malaria present.
June 26	..	..	..	Fed 83 flies.	June 29	..	..	..	Fed 38 flies.
" 27	..	..	..	" 64 "	" 30	..	..	..	" 62 "
" 28	..	..	..	" 27 "	July 1	..	..	..	" 62 "
				Blood examined.				Trypanosomes absent.	Malaria present.
July 2	..	..	..	Fed 140 flies.	July 6	..	..	..	Fed 44 flies.
" 3	..	..	..	" 35 "	" 7	..	..	..	" 14 "
" 4	..	..	..	" 34 "	" 8	..	..	..	" 34 "
" 5	..	..	..	" 23 "	" 9	..	..	..	" "
				Examined blood.				Trypanosomes present.	Malaria present.

EXPERIMENT 131. Monkey (*Cercopithecus* sp.).

Feeding freshly-caught tsetse flies on a healthy monkey.

July 17	..	..	..	Fed 5 flies.	July 19	..	..	..	Fed 7 flies.
" 18	..	..	..	" 3 "	" 20	..	..	..	" 17 "
				Examination of blood.				Trypanosomes absent.	Malaria present.
June 21	..	..	..	Fed 23 flies.	June 24	..	..	..	Fed 39 flies.
" 22	..	..	..	" 7 "	" 25	..	..	..	" 13 "
" 23	..	..	..	" 28 "					
				Examination of blood.				Trypanosomes absent.	Malaria present.
June 26	..	..	..	Fed 53 flies.	June 29	..	..	..	Fed 17 flies.
" 27	..	..	..	" 47 "	" 30	..	..	..	" 108 "
" 28	..	..	..	" 5 "	July 1	..	..	..	" 36 "
				Examination of blood.				Trypanosomes absent.	Malaria present.
July 2	..	..	..	Fed 98 flies.	July 7	..	..	..	Fed 17 flies.
" 3	..	..	..	" 45 "	" 8	..	..	..	" 36 "
" 4	..	..	..	" 28 "	" 9	..	..	..	" 57 "
" 6	..	..	..	" 38 "	" 10	..	..	..	" 30 "
				Examination of blood.				Trypanosomes present.	Malaria present.

This then concludes the story of sleeping sickness in Uganda. We have seen that probably this disease was introduced from the Congo on account of the greater movement of natives under the march of civilisation and the Pax Britannica. We have seen that the disease is caused by the entrance into the blood of a protozoal parasite, and that the infection is carried from the sick to the healthy by a species of tsetse fly. We have seen that the distribution of this fly corresponds with the distribution of the disease. Where there is no fly there is no sleeping sickness. In other words, we are dealing with a human tsetse fly disease.

OUR PRESENT POSITION WITH REGARD TO ENTERIC FEVER IN INDIA.

BY CAPT. W. S. HARRISON.
Royal Army Medical Corps.

OF all the diseases that affect armies, the one that stands above all others in importance is enteric fever, and this especially in India. Wherever medical officers meet, this disease is certain to be discussed, and the problem of its prevention is by far the greatest source of anxiety to administrative medical officers in India. We have bestowed on the problem care unlimited, care such as is never given to the civil population of England, and indeed would be impossible in that country, and yet not only is enteric fever not reduced, but the contrary obtains, whilst cholera and dysentery have both been practically abolished as endemics among British troops in India. The following figures, calculated from the statistics in Army Medical Department Reports, show well how we have progressed, or otherwise, in the districts comprised in the old Bengal command. I take this command because it is included in the endemic zone of cholera, and because it comprises in it almost all the varieties of Indian climates and conditions.

MORTALITY PER 1,000.

Decade	Remittent and Continued Fevers, including Enteric Fever	Dysentery	Cholera
1860-69	2·88	2·62	8·86
1870-79	3·71	1·36	3·35
1880-89	4·70	0·79	1·86
1890-99	7·81	0·88	1·25

In the earlier years quoted most deaths from malarial fevers were included among remittent and continued fevers. I have not included them among the figures for the years since malarial fevers were differentiated in the statistics. It is probable that, if malarial fevers were omitted from the figures in the earlier of the years I

have quoted, the increase of enteric fever in the districts under consideration would appear even more startling. So this is how we stand; we have, by our sanitation, reduced dysentery and cholera in Bengal, the latter enormously, and yet we have absolutely failed to touch enteric fever. How, then? We have been taught that enteric fever, dysentery and cholera are water-borne diseases; we have believed our teaching and have based our sanitation, as regards the prevention of these three diseases, practically entirely on this idea. For what is it that we do in this matter? We boil water, we add permanganate of potash to it, we watch soda water factories both in barracks and bazaars with the most jealous care, we establish piped water supplies from pure sources, dairies are established for the supply of pure milk and butter, and as far as possible the consumption of milk and butter from other than approved sources is prevented, wells are carefully steened and protected from pollution, mussacks are abolished and metal receptacles for the carriage of water are substituted, men are required when on the march to fill their water-bottles with boiled water or cold tea, and the water supplies of camps are carefully protected from contamination, every possible source of infection through water that human imagination can conceive is carefully guarded against; and the results are these, that cholera and dysentery have been reduced enormously and yet enteric fever is not only not reduced, but is on the increase.

There have been, and are, many explanations of this. We have introduced younger and more susceptible troops, but apart from the fact that enteric fever cannot arise without infection with the specific virus, the short service system has long ago had time to show its full influence in this direction and cannot be blamed for the present increase of enteric fever.

The bazaars are blamed, yet soldiers have frequented bazaars ever since we occupied India, and, moreover, young officers who never go near bazaars are affected almost equally with young soldiers.

The water-borne theory of enteric fever, which has dominated and still dominates our sanitation in India, was born in England, and it has been found to be true in so large a proportion of cases in that country that it has been elevated into a dogma universally applicable. England is a country covered with herbage, rarely free from rain for more than a week or two at a time; dust is a trifling factor and is almost absent except on the public roads during dry seasons; flies are comparatively few. India, on the

other hand, is a country free from rain for months at a time, and during that time it is covered with dust to a degree unimagined by those without tropical experience; flies and insect life of all descriptions constitute some of the chief inconveniences of life in that country. The conditions are different, and it is a fair presumption that the results will be different also—and they are.

Practical demonstration of the fact that enteric fever can be spread by other means than water has been given in the South African War, in the Spanish-American War, by Quill in the Ceylon epidemic among Boer prisoners, and in the Landi Kotal epidemic of 1898, of which the writer had personal experience. In this last epidemic a camp which was at first supposed to be a temporary one had gradually developed into a standing camp. The ground was dry and easily raised as a fine, almost impalpable, dust; on three sides of the camp were latrine trenches which in course of time had gradually approached the camp walls; the water supply was carried on mules from a spring some two miles away, which had its source in uninhabited country on the other side of the valley, and contamination of the spring by drainage from the camp was a physical impossibility. The water on arrival in camp was boiled and stored in galvanised receptacles provided with taps and tight fitting lids; moreover, the water was examined bacteriologically by Mr. Hankin, of Agra, and declared free from suspicion. After a few sporadic cases enteric fever broke out in epidemic form at the end of May, and during June and July it simply raged. Of the two British regiments present at the time, the Oxford Light Infantry, with a strength of 777 men, had eighty-four admissions and twenty-seven deaths from enteric fever; and the Royal Sussex Regiment, with a strength of 654 men, had sixty-two admissions and nineteen deaths, nearly all in less than three months. At the beginning of the epidemic the Oxford Light Infantry had almost twice as many admissions and deaths as the Royal Sussex Regiment. Towards the middle of July the Oxford Light Infantry were moved to another camp on a fresh site, about half a mile away, and the admissions for enteric fever from among them rapidly dropped. At the end of July the latrine trenches were shut down and a removal system started, the excreta being removed to a place about one and a half miles away from camp: by the middle of August the epidemic was practically ended. The following table shows the course of the epidemic.

	April	May	June	July	August	Sept.	Oct.	Nov.	Dec.
Admissions	1	17	53	55	15	5	2	3	3
Deaths	—	4	17	11	4	1	—	—	—

The water supply remained the same throughout, and its treatment was not altered, yet the epidemic stopped short. To those who were present at the time there could not have been a more convincing proof of the fact that, in this case at any rate, it was the presence of the latrine trenches round the camp, across which dust devils played two or three times a day, that produced the epidemic, and that water-borne infection had nothing whatever to do with the matter.

Our experience of women and children in India also points to the fact that water is not the only, and perhaps not even the chief, carrier of typhoid infection in that country. They are by far the greatest consumers of water and milk in cantonments and, moreover, they generally prefer to take them unboiled; yet the incidence of enteric fever among them is infinitely less than it is among the officers and men.

The records, quoted above, of cholera and dysentery, both admittedly water-borne diseases for the most part, show that our sanitary measures for the prevention of water-borne diseases have been well carried out, for cholera and dysentery have both been greatly diminished; yet enteric fever fails to respond to the same measures. The bacteria of cholera and enteric fever are killed with equal facility in water, but they have this difference, that whereas the cholera vibrio is easily destroyed by drying and exposure to the sun, the typhoid bacillus, on the other hand, resists these influences for a considerable time.

It has been demonstrated by Firth and Horrocks that in England the typhoid bacillus can live in dust for twenty-five days, and in dust exposed to the sun for fourteen days, during one hundred and twenty-two hours of which the bacilli were exposed to sunshine: the same observers also showed that the contagion can be carried by flies. Aldridge, later, has shown that in India typhoid bacilli can be recovered from earth contaminated with infected urine after nine days of drying. In some experiments made in India by Capt. L. W. Harrison, R.A.M.C., and myself, we found that typhoid bacilli survived in dust contaminated

with infected urine for five days, and in the same dust exposed to the June sun of India for nearly three days, during seventeen and a half hours of which the dust had been exposed to the direct rays of the sun, the average temperature shown by a thermometer buried in dust under similar conditions being 53° C. (127.4° F.). In the first of these experiments the dust was dry enough to be raised as a cloud after five and a half hours, and in the second experiment after two and a half hours, so that ample time is left in all cases for the wetted ground to be raised as dust and blown through and through camps and barracks, carrying infection. Latterly, Wasdin has demonstrated the presence of foci of typhoid infection in the lungs of patients, showing that the contamination of water and food-stuffs is not an absolute necessity for the production of the disease, but that infection can be brought about by direct inhalation of infected particles. And in any case, we all swallow quite enough dust in India to give it a fair chance of doing harm if it should happen to be infected.

The facts I have quoted above and a thousand and one others point, I think, to the fact that the continued prevalence of enteric fever in India, and its increase, cannot be accounted for by the purely water-borne theory of the disease, and that, indeed, the contamination of water probably plays only a small part in the matter, and I think that the system of conservancy among barracks and camps in India can be shown to be by far the largest factor in the continuance and increase of enteric fever in that country. We know that typhoid bacilli are excreted from the bowels of patients and, to a less extent, of convalescents from enteric fever; and it has been shown by Horton Smith and others that the urine of 20 per cent. of convalescents from enteric fever contains Eberth's bacillus, and that it may continue to be so contaminated for as long as six months—it has even been said for as long as eleven years—after the attack of the disease. In the years 1891-1900 the average number per 1,000 constantly sick with enteric fever was 3.43. If we take it that the period of convalescence and possible infectivity in each case was only as long as the stay in hospital, which is putting it on its lowest basis, and that 20 per cent. of the convalescents had infected urine, then the average number of men in barracks with constantly infected urine works out, for the years in question, to 0.68 per 1,000. In other words, for at least two hundred and forty-eight days of each year each regiment of 1,000 men was constantly exposed to infection from the urine of one of its number. The

urine and fæces, then, are the chief sources of danger, and it is useless to seek for roundabout causes of the prevalence of the disease till we have dealt effectively with these which lie at our very doors. And how are we now dealing with them? In barracks the latrines have mud floors for the most part, the seats are without lids, and the fæces are passed into a row of conical earthenware pots, which are generally sufficiently far from the seat to ensure that the ground shall be soiled with urine at any rate; the pots are cleaned out superficially without the use of any disinfectant, and the fæces are supposed to be covered with dry earth when passed. A dust-strewn floor invariably contaminated, a row of contaminated pots open to the visits of flies, and a provision of carefully dried dust to pour on to the fæces and ensure a carriage for the typhoid bacillus if it be present; all this within a few yards of the barrack rooms. The pots are emptied into a receptacle, and this in its turn into a filth cart, a certain amount of the contents spilling on the ground in each process. The filth carts are drawn to a place a mile or so from barracks and there the contents are dumped into shallow trenches, and covered with a few inches of earth, dry as dust for the major portion of the year; there the filth is left to fertilise the ground in part, and also to be blown back as dust to barracks if it fits the wind to set that way. It is claimed for this trenching process that the fæces soon lose all fæcal smell; unfortunately, typhoid bacilli have no smell and may exist in most innocent seeming dust. In camp, the fæces are passed into (or on to the sides of) shallow, open, dust-lined trenches, an even more ideal method for ensuring the carriage of any stray typhoid bacilli into the men's lines, whether attached to particles of dust, paper, the bodies of flies, or the soles of the men's boots. It is true that the trenches are on the side of the camp away from the prevailing wind, but, unfortunately, there are other winds, and there are dust devils, so it is a certainty that at some hour or hours of the day the wind will blow directly from the latrine trenches into the camp, and even if this does not happen, there are the flies which swarm in camps of any standing, and there is the fouling of the men's boots, carrying fæcally contaminated dust into the very tents, there to be shaken into a cloud every time the men arrange their blankets.

But contamination from fæces is the smaller evil, fæces are at any rate deposited in one spot as a rule, and the chances of their containing infection are probably not as great as is the case with urine, and this, which is the greater source of evil, besides helping to contaminate the latrines, is spread broadcast through camps and

barracks alike ; the provisions made for its disposal, and the unfortunate fact that it leaves neither visible trace or smell after a short while, ensure that this should be so.'

In barracks the urinal is generally a lattice-built structure, with a mud, or rather dust, floor, on which droppings which do not reach the trough fall, there to be incorporated with the dust and blown into the adjacent barrack-room. Flies have free access to the trough and urinal at all times, the urine is caught in a receptacle innocent of all disinfectant, and from this it is poured into the filth cart, a certain amount being slopped on the ground in the process ; the urine is then carted away and dumped, without any further treatment, along with the fæces. The urinals are at the end of a long verandah so that at night they are practically not used, for the simple reason that men prefer to micturate on the nearest ground outside the barrack-room rather than to walk the length of a long verandah in their night clothes to the urinal. Officers and men alike are equally without conscience, or knowledge, in the matter of fouling the ground with urine. In camp matters are even better calculated to ensure this fouling of the ground. For day use there are a few urinals, pits dug in dry earth, outside the camp perimeter, and for night use a few receptacles near the camp, unmarked by any light and approached by a narrow, rough path. During the day a visit to the urinal entails a considerable walk over rough ground, and at night a series of stumbles in the dark over ropes and tent-pegs to an unmarked destination. What happens then is that, during the day, there is no more common sight than to see, after the men return to camp, practically the whole of them micturating on the ground outside the camp perimeter ; protest is of no avail, it is outside the camp, and the mess will soon dry up ; the average line officer's idea of an insanitary condition can be translated into the expression—"smell and visible dirt." If one explains that a proportion of the men are certain to have typhoid bacilli in their urine, one is looked upon, and treated, as a visionary. At night the urinals are practically not used, except by the men in the tents quite close to them ; officers and men micturate on the ground outside their tents and no regulations in the world can stop it, because it is almost impossible to catch the offenders in the dark, and if they are caught, they will probably be dealt with by an officer who is guilty of the same offence himself and sees no harm in it.

The ground on the sides of the day urinals and around the night urinals is slopped with droppings, and on this the men stand,

soiling their boots and carrying possibly infected dust back to their tents, the wind and flies help further to carry the infection if there are any men in camp with infected bladders. This is a condition of affairs which is, I think, in the experience of every medical officer: it is deplorable, but not without remedy. Of first importance in this direction it is essential that no man should leave hospital, after having had enteric fever, until his bladder had been disinfected by a course of urotropine (10 grains thrice daily for a week), or by washing out with some suitable antiseptic. I would suggest that this disinfection of the bladder should be done before the man is allowed out of bed, otherwise there is a certainty that his urine will be passed into the common urinal or latrine of the hospital, the contents of which are treated in the same manner as, and along with, the barrack excreta. In the second place it is necessary to ensure that urine and fæces shall be deposited only in the places appointed for them, and that they shall lie there till removed, free from all risks of being carried through barracks or camps by flies, as dust, or on the men's boots. In this regard the present dry earth system stands condemned as the very worst system that could possibly be devised, and the present arrangements for the disposal of urine both in camps and barracks are no better. In the place of the former it is necessary to substitute some form of water-closet, and in place of the latter it is essential that such ample means of disposing of urine be provided both in camps and barracks as will ensure that it is as easy to micturate in the right place as in the wrong one. The ideal system in barracks would, of course, be some form of flushing water-closet and urinal; but these are impossible in the majority of cantonments of India, both on account of the difficulty of providing sufficient water and on account of the difficulty of disposing of the consequent large bulk of sewage in the almost dead flat stations in the plains.

For the latrines in barracks I would suggest those on the trough principle, the troughs to be very wide at the top to avoid fouling of the sides, and to be half filled with a solution of some disinfectant and deodorant. The troughs could be cleaned out daily, or twice a day, the contents being run through a very wide trap at one end of the trough into a watertight receptacle and carried away on a carriage frame for the receptacle, to be sterilised by heat; the troughs after cleaning to be again half filled with disinfectant solution, stored in a cistern at the upper end of the trough. The floor of the latrine would be of flags with cemented joints of cement, the seats of the latrine would be hinged for

purposes of cleaning and would be provided with lids closing automatically. The day urinals also would have impermeable floors which would be raised as a platform just under the troughs, so as to compel the men to stand close up to the trough and so avoid droppings on the floor; the building would be made fly-proof, and the receptacle into which the urine runs would be provided with some disinfectant, while the communicating pipe between it and the trough would be so arranged that no flies could enter it to get infected. The walls, floor and trough of the urinal would be swabbed daily with some disinfectant; the disinfectant for the trough flowing into the receptacle would serve to sterilise the whole of the urine collected in it. The urine would be carted away daily and, being already disinfected, it could be dumped in any convenient spot with perfect safety.

The question of night urinals is a more difficult one. If one leaves the men with only the present day urinals they will not use them and the ground will continue to be soiled; if one provides occasional urine tubs or other receptacles for night use, the same result will follow, plus a slop round the tubs. Urinals off the barrack-rooms would be objectionable on account of smell, and, moreover, unless sufficient were provided, say four to a company, the soiling of the ground would continue little abated. The simplest plan of all would be to provide each man with a chamber pot for night use, it is the best arrangement for preventing droppings on the floor, for the men would hold them close up when using them. If they had a quantity of disinfectant put in them the urine would be rendered harmless as soon as passed, they could be emptied and cleansed each morning, and a fresh supply of disinfectant could be put in them. The presence of non-commissioned officers in the room and the general feeling among the men would ensure their proper use, and the fact that they are used in the hospitals and cause no trouble there shows that they are practicable. The chief objection to them arises from the presence of drunken men, but if a man is too drunk to use a chamber-pot he is too drunk to be in the barrack-room; the guard-room is a more appropriate resting place for him.

For camp latrines I would suggest that, instead of the present open shallow trenches, the latrines should be made of a deep trench, say 5 or 6 feet deep and 18 inches wide, to avoid soiling of the sides; over this would be placed a row of dome-shaped seats of sheet iron, something like inverted porridge bowls without bottoms to them, 2 feet wide at the bottom, 1 foot wide at the top and 1 foot high.

I suggest the dome-shape both for strength and to avoid soiling of the inner surface with diarrhoeal discharges or urine. The interstices between the seats would be filled with earth and stones. The fæces in the trench would be covered twice daily with some of the excavated earth, and as lids would soon prove unserviceable, the visits of flies would be prevented by sprinkling the trench freely with kerosene oil or chloride of lime. An hour or two before camp was struck the seats would be sterilised by placing for a minute or two over a fire of camp rubbish ; they would be packed when cool. As the seats of the shape I suggest would rest one into the other. I calculate that a sufficient supply of them for a regiment could be carried by one mule. For day urinals in camp I would suggest troughs of sheet iron supported on light metal trestles, the troughs would open at one end over a narrow deep pit, into which the urine would fall, the earth at the bottom of the pit would be loosened and a sufficiency of disinfectant dug into it, the ground under the troughs also would be impregnated with some disinfectant to receive droppings, and the trough, ground and pit would be sprinkled with kerosene oil to keep off flies. If the troughs were arranged radiating from the pit sufficient accommodation for a large number of men could be made with one pit. The troughs and trestles would be sterilised in the same manner as the latrine seats on striking camp. For night use in camp a latrine on the same principle as the day latrine would be provided nearer camp, the contents of the latrine would be well covered each morning and the latrine closed during the day. The night urinals should be plentiful and as near to the men's tents as possible : they could best be arranged by putting tins with some disinfectant in them at intervals along the sides of the company streets at retreat ; the sites for them would be specially arranged by having a plinth on which the tins could rest, so as to bring it high enough to prevent droppings as far as possible, and the ground round would have some disinfectant dug into it.

In all cases the roads to latrines and urinals should be wide and well made, and all night latrines and urinals should be provided with lights, both to distinguish their locality and also to prevent men accidentally fouling the ground in the dark. Having made these provisions, or similar ones, and having especially made it quite as easy to deposit excreta in the right place as in the wrong one, it should be looked on and treated as a most serious offence for officers or men to foul the ground of camps or barracks as they do at present.

I am well aware that the suggestions which I have made are

open to many criticisms and are susceptible of many improvements ; this must of necessity be so when the ideal scheme is impossible, but I think, at any rate, that the facts I have quoted in this paper show the urgent necessity for a radical reform in the conservancy system of British troops in India. The measures to bring about that reform will cost money—they will probably cost a lot of money—but if the country has any care for the lives of the soldiers entrusted to it the money will have to be spent ; and, after all, to put it on its most mercenary basis, if we only reduce the death-rate from enteric fever by 25 per cent., taking the present mortality at 6 per 1,000 and the value to the country of each soldier at £200, the annual saving to India would be £18,000. Surely a sufficient inducement to the finance department to open their pockets.

THE MEDICAL SERVICES IN THE RUSSIAN ARMY. (PEACE.)

By LIEUT.-COL. J. HICKMAN.
Royal Army Medical Corps (Ret. Pay).

THE Russian Empire comprises thirteen military commands. This includes the Cossack territorial districts, which number eleven (six in Europe, five in Asia), and which are regulated by a special code.

The Army Corps, the military establishments, and every detail of the forces, are placed under the authority of the General Officer Commanding the district; in nearly every case he is also the Governor-General exercising the supreme civil control.

As the strength of the Russian Army varies from year to year, only an estimate of the number east of Lake Baikal at the outbreak of the hostilities is appended.

The Times estimate put the composition of the Russian forces as follows:—

Infantry, 107,000; Cavalry and Cossacks, 22,500 (since heavily reinforced); Artillery, 10,500 men, with 174 guns, 24 horse artillery guns, 22 mountain guns, 36 quick-firing field guns (now probably about 150 of this pattern), 8 heavy guns.

Deducting the men required for garrison purposes and for the guarding of the line, the Russian field army should consist of about 80,000 infantry, 20,000 to 30,000 cavalry, 8,000 artillery, with 250 guns, and engineers and technical troops.

Reinforcements have been steadily moving east, at the rate of about 2,000 men per week, or rather more.

The Russian reports that Russia has 500,000 men in the Far East are not to be taken seriously. The difficulty would lie in the feeding of so large a force during the winter. But undoubtedly a powerful army will be concentrated in the zone near Lake Baikal, and will move east as soon as stores can be accumulated.

Russia can dispose of 5,000,000 trained men, so that her efforts will be limited solely by the question of supplies and communications. These have to be carried on along a single line of rails, not well laid.

The garrison of Port Arthur is put at something less than 30,000 men, though it was given out by the Russians as 70,000 men.

Since this estimate the Russian Army in the Far East, at the end of March, has been varied to 230,000 men.

Since 1874 Russia has enforced universal service. Every young

man who has reached twenty-one years of age in the month of October draws lots in the December following; the requisite number having been drawn, they are submitted to medical examination, the rejections being filled up by those next on the list. The recruits, it may be added, appear before a local board, and later on before a special government board.

The resources of recruiting are so considerable in this enormous Empire, in which the population is 138,000,000, that not even one-third of the conscripts have to present themselves for medical examination. In 1901, 1,139,151 conscripts were liable for service, and about one-fourth of this number were taken into the regular army. The minimum height of a recruit is fixed at 1.534 metre, about 59 in. It would seem that the ordinary estimate of the height of the average Russian must be erroneous. The obligatory service lasts till forty-three, five years in the regular army, thirteen years in the reserve, and four years in the territorial militia. Except in Turkestan and Siberia, the active service really lasts only four years, and, as in other foreign armies, in special cases, passing examinations, &c., this period is further reduced.

Personnel.—The Army Medical Services consist of—

(1) Medical officers, apothecaries.¹

(2) Pay and other clerks.

(3) The sanitary corps includes feldschers, hospital attendants and stretcher bearers, Sisters of Charity and officials of Red Cross Societies.

The division between combatant and non-combatant officers in the Russian Army is marked; the medical officers come under the latter class. All, however, have a special rank in the roll of precedence in the Empire (tchin). The four senior grades are nobles and are entitled to be called "Excellence." The place of rank in the tchin is always given in official documents. An Inspector-General is in the third grade, and would be addressed as "His Excellency Inspector-General of the *n*th Division, Privy Counsellor, Doctor X."

Nearly all the medical officers and apothecaries are recruited from the pupils of the Military Academy of Medicine at St. Petersburg; some, however, are educated at other medical schools. They enter the Academy at 17 and pass five years there, and are then drafted into the Army as subaltern medical officers. The Academy is an

¹ In accordance with a prikase of November, 1902. From 1904 the Veterinary Department has become a separate unit and is no longer a part of the medical organisation

important faculty ; besides medical degrees it confers dental diplomas and certificates to midwives, and about one half of the students become army medical officers.

All the students undergo military training : they go into camp for three months the first year of their course and form a special company comparable to our University volunteers. To meet the requirements of the Army the number of those entering is not sufficient, even admitting the small relative proportion of medical officers to the total forces. In time of peace about 2,000 medical officers are considered ample for this enormous army. In war time the civil population is so sparsely supplied with doctors that it will be difficult to draw on this reserve.¹ This want of skilled medical attendance is known well in the Russian army : to endeavour to meet it the authorities have carefully organised schools for the education of hospital attendants and so-called assistant surgeons ; a good many women are included in these classes. Medical officers are not mounted except in war ; they draw the pay of their relative rank. Apothecaries occupy much the same position as this class formerly did in our Army ; all the drugs, dressings, &c., are manufactured at a special army institution at St. Petersburg.

The section corresponding to our army clerks have more to do with the internal administration and finance ; they are classed as clerks, pay clerks, secretaries and stewards (*smotritel*).

Sisters.—The recruiting and instruction of Sisters is undertaken by the Red Cross Society. They follow a course of two years, and are then attached to a military hospital for further training. On completing their studies they take up their duties as Sisters of Charity. Their number is not so great as in our Army ; for example, in the large hospital at Warsaw there are only twenty. They are, and perhaps rightly, employed as nurses only in serious cases ; they supervise the cooking and are entrusted with the care of the linen and hospital clothing, and in some hospitals they

¹ In normal times, ever since the 'eighties, no Jewish doctor ever receives an appointment in either the Army or in the Navy. But during the war, when lives and fortunes are at stake, Jews are pushed forward. In the large cities many Jews occupy distinguished positions in the medical profession. They have all been enrolled and sent forthwith to the front. The proportion of doctors of the orthodox faith called out is very small ; the Government avails itself of the most skilled medical assistance and at the same time deals a blow to the Jewish community. Likewise in every regiment furnishing detachments for active service Jews are included, so that Jews form 10 or 11 per cent. of every detachment sent to Manchuria.

manage the laundry. In fact, their nursing duties resemble those of a matron of a small hospital or home.

ARMY MEDICAL CORPS.

Feldschers.—This is a German term; it signifies a hospital attendant to whom a very careful training has been given. In Russia there are five schools for feldschers. The first two years the pupils are given a general education, and later on they go through a medical course; in education they are comparable to apothecaries in our Indian Army and, like them, are very useful auxiliaries. For a large army in the field it is estimated that at least 10,000 feldschers would be required. Not half that number is available. The ordinary hospital attendants are recruits transferred from regiments, as in the early days of the R.A.M.C. Usually they are men inefficient in the ranks, but considered suitable for attendance on the sick. They are carefully instructed, and under the strict discipline of a continental army become trained orderlies. The stretcher bearers are purely regimental, comprising the band, &c.; on paper they seem to be sufficient in number.

ADMINISTRATION AT HEADQUARTERS.

The medical services are directed by two authorities perfectly distinct—one is purely medical, the other is military and administrative. The duties of the Surgeon-General-in-Chief are in medical details the same as our Director-General; he is responsible for the *personnel* and *matériel* of everything connected with medical and sanitary arrangements. An advisory board also assists the Inspector-General, who sits as President: the permanent members are the President of the Medical Council, the Chief Medical Officer at the Home Office, the Director-General of the Navy, and the Principal Medical Officer of the Army Corps of St. Petersburg. As consultants, medical officers of the Service, either on the active or retired list, who are specially distinguished by their scientific or administrative qualities, can be chosen as members. The second administrative council is part of the supreme council of war (hospital committee). Its sphere is to organise and direct the purely administrative part of the medical services. It is composed of military members, but the Inspector-General has a seat in its deliberations. It deals with the discipline, pay of the *personnel*, the distribution of the hospitals, their stores, feeding and equipment, and their general working. It is apparent that the functions of these two Boards must frequently overlap each other; the second

Board is, however, the superior authority and accepts or not the conclusions of the first.

TERRITORIAL DIVISIONS.

This is organised on the same lines as the headquarter staff mentioned above: the Surgeon-General exercises the same disciplinary power over medical officers and subordinates, and, amongst other functions, he can give permission to marry and can grant as much as four months' leave. The officer commanding possesses all the attributes of the hospital committee and uses them frequently. He supervises in general the administration, the clerks and other employés, and interferes actively in every detail of the working. The chief Army Service Corps officer manages, with scarcely any reference to the medical officers, the supplies and transport; the arrangements for sick convoys are also confided to him.

Army Corps.—The principal medical officer is endowed with similar powers. In the regimental units the distribution is as follows :—

	FELDSCHERS		ORDERLIES		STRETCHER BEARERS		BEDS
	Peace	War	Peace	War	Peace	War	
Infantry Regiment	22	22	4	7	64	122	84
Sharpshooter Regiment	6	6	3	3	16	32	28
Cavalry Regiment	9	9	3	—	24	48	30
Brigade of Artillery	7	7	1	1	—	—	48

There are three classes of hospital—detained wards in the barracks, accommodation in a small regimental hospital, and the permanent hospitals. The last eventually admit any serious cases: they are divided into four classes according to their size, the largest containing over 1,000 beds for N.C.O's. and men, and sixty for officers. The chiefs of these hospitals are military officers of the headquarter staff, and under them directly are placed the principal Medical Officer and a steward. It may again be repeated that the Principal Medical Officer exercises his command simply in professional matters; the medical officers junior to him, the feldschers, and the apothecaries, are under his orders. Consulting surgeons and physicians are attached to all the large hospitals to assist with their advice in all serious cases. To give one example, a hospital of 207

beds would have the following staff: a Colonel Commandant and an Assistant Commandant, three Medical Officers, two apothecaries, two book-keepers, six feldschers, six clerks, twenty non-commissioned officers, fifty hospital attendants. One Sister is attached to each division of the sick. Most of the hospitals have a bacteriological laboratory, and portable cabinets for all sorts of analysis are sent out to the smaller hospitals. The steward or manager, though not of commissioned rank, is a very important official; his analogue is to be found in all civil hospitals where the professional staff is occupied only in the treatment of the sick. In contradistinction to our ideas, the large hospitals are diminishing in number and the smaller well-equipped ones are being established everywhere; the tendency is to treat the sick in the station hospitals and to avoid their transfer to the larger institutions. There are two large convalescent homes, one at St. Petersburg, the other at Moscow.

The Cossacks have special hospital arrangements; their wives and children sometimes accompany them to hospital: there are twenty-eight establishments at present in the voiskos of the Don, of the Ural and in Siberia. As in the French army, there are also, for chronic invalids and convalescents, numerous other hospitals situated in the different health resorts and in the places where water cures by hydropathy and mineral springs are carried out. It may be mentioned that, as recently adopted in our army, a post-graduate course at the St. Petersburg Academy is followed by each medical officer. There they are attached to hospitals and attend classes in all subjects of medico-military interest, which course must render them more useful as army surgeons. The details of army medical practice and administration are not presumed to be possessed by anyone holding a medical diploma.

In point of fact, especially in the training of the feldschers, nothing is spared to render the medical services effective. It will be seen that there is nothing new in this organisation; the manufacture of all the drugs, compressed tabloids, &c., dressings, &c., by an establishment exclusively military is perhaps the only novelty. The military arrangements of all the great European Powers are framed on much the same lines, but not in similar proportions. This present war will demonstrate how limited are the medical resources of the Russian Empire, and how impossible it is at a short notice to remedy this want.

(The arrangements in war time will appear in the next number.)

THE INFECTIVITY OF SCARLET FEVER.

BY LIEUT.-COL. R. H. FIRTH.
Royal Army Medical Corps.

ALTHOUGH this disease is not of very frequent occurrence in the Service, still the contingency is always possible, especially in the depôts and home garrisons; therefore any facts which tend to throw light upon the infectivity of scarlet fever and the question of its epidemic management are of importance to the army medical officer. Until quite recently it has been the almost invariable practice to retain patients suffering from this disease either in hospital or in their own quarters until the last trace of dead cuticle has vanished, but for many years past there has been a growing tendency to doubt whether the orthodox views with regard to the infectivity of the desquamated cuticle were based upon sound evidence. As we well know, the desquamating process is apt in some cases to drag on almost indefinitely, and, having apparently ceased, it is not unusual to find that it has recommenced. This sequence of events entails often an enormous tax upon isolation accommodation, and children, otherwise well, have to be detained for many weeks before the responsible officer cares to risk his reputation for what may be regarded as premature discharge. Some recent events in civil life have practically proved that what are termed "return" cases of scarlet fever are due in the main to existing or recurrent rhinorrhœa or otorrhœa, or to the persistence of infective material in the air passages, rather than to incomplete desquamation of the cuticle. Acting upon this knowledge certain medical officers of health have succeeded in reducing the number of their "return" cases to very small proportions by keeping patients about to be discharged in what may be called a diluted, if not entirely uninfected, atmosphere, and by the diligent application of nasal and aural and throat syringing.

An instructive paper upon this subject appeared in the *Lancet* of March 12, p. 72, by R. E. Lauder, the medical officer of health of Southampton; and it may be useful to recapitulate briefly certain points which he emphasises, as they teach some valuable lessons in sanitary administration. On the arrival of a case of scarlet fever at the isolation hospital it is examined in the ambulance and a swab taken from the throat for bacteriological examination. Doubtful cases are put into an observation ward, but cases of undoubted

scarlet fever are placed at once in what is called an "acute ward" until the acute phase of the disease has passed, and a bacteriological examination of the swab has excluded diphtheria. Once the acute phase is over the case is removed to a general ward, where all recent cases are kept apart from those which are convalescent; and if an aural or nasal discharge supervenes, or other complications arise, the patient is removed to a ward reserved for the purpose. At the end of the third week, if free from complications, the patient is transferred from the general ward to another pavilion which has been thoroughly disinfected, and to which no cases are admitted except through the out-bathing station with the same precautions as if they were being finally discharged from hospital. In this pavilion or ward the patient stays one week, the nose, ears and throat being syringed with a disinfectant each evening. At the end of this, the fourth week of disease, the patient undergoes the usual final bathing process and is discharged, no matter whatever may be the condition as to desquamation. After discharge of the patient the ward or pavilion in which he was housed is thoroughly disinfected. The general wards are disinfected at least once a month, or as indicated by the condition of the inmates. Mr. Lauder maintains that this method has not only freed the patients from the usual complications, such as rhinorrhœa, otorrhœa, enlarged glands and albuminuria, but reduced the duration of the fever and the length of stay in bed. Before the adoption of this system the average stay in hospital was forty-eight days with 4·27 per cent. of "return" cases; since the system has been carried out the duration of stay in hospital has been but thirty-four days with 2·15 per cent. of "return" cases. These experiences are certainly suggestive, and further experiments on the same lines will be watched with interest. It is notorious that the severity of scarlet fever outbreaks, and the number of "return" cases, varies enormously in different years and places; therefore we need to be cautious in any generalisations, but we feel convinced that Mr. Lauder is working on right lines by differentiating his cases and providing a large number of small wards. Although such a provision means often a greater initial and administrative outlay, still, if the duration of stay in hospital be curtailed, a greater number of cases can be accommodated in a given time; we believe this to be the only true way of dealing with the isolation hospital problem. Apart from these administrative considerations, the experiences given are of the first importance as tending to elucidate the channels of infectivity in scarlet fever. It is probable that the orthodox belief in the

dangers of cuticular desquamation in scarlet fever will die hard, but for our own part we welcome this attack upon a view which has little more than tradition to support it. The newer method is based on experience, observation, and a belief that more segregation and classification of cases are essential; and, moreover, that "return cases" of scarlet fever are attributable not to the peeling condition, but mainly to undetected discharges from the respiratory passages and ears in those who have left the hospital. The value of personal observation in arriving at this belief is enhanced when we recall our want of knowledge of the specific organism of the disease, and our ignorance of where and when infection ceases.

WITH THE ABYSSINIANS AGAINST THE MULLAH.¹

BY MAJOR J. WILLES JENNINGS, D.S.O.

Royal Army Medical Corps.

ON September 26, 1903, Capt. H. N. Dunn and I reported ourselves at the office of the D. G., A.M.S., and were informed by the D. D. G., Surg.-Gen. Keogh, that an Abyssinian contingent was to co-operate with the Somaliland Expeditionary Force against the Mullah, and that King Menelik had asked for the services of two British medical officers. Our luck in being selected for the posts was only equalled by our delight at the prospect of going. We had both served in the Egyptian Army, and five and four years, respectively, in the Sudan. Our thanks are due to Lieut.-Col. Russell, R.A.M.C., and to Mr. Barnes, for their valuable assistance in drawing up the lists of the medical and surgical materials which we were each required to take with us, and of the reserve stores, which it was arranged could be ordered at any time by wire. It is not necessary, in this place, to give full details of these, but in the course of the notes various suggestions and criticisms will be made. Later in the day we were informed that our passages to Aden had been booked on the P. and O. s.s. "Britannia" for October 2, that the Senior Naval Transport Officer at Aden would arrange for our further passage by the most expeditious route, and that an advance to us had been authorised of thirty days' pay and ninety-one days' field allowance, together with an imprest of £100 to meet any expenses to which we might be put in connection with our service in Abyssinia, and for which we were to render an account to the Field Controller of the Somaliland Field Force. Whilst employed on this special duty we were to be entitled to a personal allowance of 10s. per day on board ship and £1 a day in Abyssinia, in addition to the regimental pay of our rank, this to be inclusive of all army allowances, including subsistence.

We were required to take complete camp, field and hospital equipment, together with four months' provisions. On September 29, we had the advantage of an interview in London with Lieut.-Col. J. Lane Harrington, C.V.O., C.B., H.B.M.'s. Agent and Consul-General at Adis Ababa, who told us everything and furnished us

¹ Arranged for publication by Christopher Addison, M.D., B.S.Lond., F.R.C.S., Lecturer on Anatomy, Charing Cross Hospital Medical School.

with his invaluable "General Notes on Outfit, Transport, &c., for Abyssinia." It would take too long to give a complete list of the stores taken, and here again we must content ourselves with comments by the way.

For big game I took a Rigby double-barrel, special reflex .450 rifle, 10½ lbs. weight, with indiarubber butt plate, 28 in. barrel, and carrying a solid nickel covered bullet of 480 grs., a .303 Mauser Metford for small game and a 12-bore double-barrel shot gun.

We were originally instructed to purchase at Aden such stores as potatoes, onions, biscuits, tea, sugar, tinned milk, ghee (native butter), candles, soap, &c., but on arrival there we received a wire from Col. A. N. Rochfort, C.B., R.H.A., who was to command the force, to the effect that most of them could be obtained at Harrar, so that the number of things we each had to buy at, and transport from, Aden was much less than anticipated; they were, precisely, six canvas water bottles, three canvas water buckets, two candlestick lamps, with two extra globes for the same, three tins of Keating's powder, two two-pound tins of lard, two packets of salt, four tins of arrowroot, two tins of hops, one pound of lump alum, two packing needles and ball of English twine, six bottles of lime juice—strong, and five packets of candles.

My warm thanks are due to Capt. A. Duff, 3rd Gordon Highlanders, in giving me details of the arrangements and distribution of supplies, especially for the native servants. The syce (groom) and the tent boy were engaged for us at Aden by Messrs. Cowasjee Dinshaw Bros.

We joined the P. and O. s.s. "Britannia" at Marseilles on October 9, and reached Port Said on the 13th, when we were joined by Mr. J. L. Baird, Diplomatic Service. We received a wire there saying that the Mullah had broken south near Obbia—a false alarm we hoped. Our table on board was made up as follows: Gen. Sir A. Hunter, Capt. A. Duff, Capt. H. N. Dunn, Mr. J. L. Baird, Capt. Lord George Murray (Black Watch), A.D.C. to General Hunter, Lieut. Ogilvy, R.E., and myself. Duff, Dunn, Baird, Ogilvy and I were all on our way to be attached to the Abyssinian Army. At Port Said Gen. Sir A. Hunter wired his salaams to the Sirdar, in which he was good enough, on his own suggestion, to include Dunn's name and mine. He received the following reply: "To General Sir Archibald Hunter, s.s. 'Britannia.' Very many thanks for kind telegram. Your old comrades of the Egyptian Army wish you, Jennings and Dunn every success and prosperity. *Bon voyage* and best of luck from us all."

On disembarking at Aden, at 8 a.m. on the 19th, we found the following wire from Colonel Rochfort: "Please leave medical stores, surplus to your probable requirements, at Aden. Tents are unnecessary, as I can supply light Abyssinian tent for inspection of sick. I can supply five colonial-pattern mule saddles for officers." On going through our belongings afterwards on the wharf it was found that my two rifles and the gun had not been put ashore, and it turned out afterwards that they, with some other things of Dunn's and Ogilvy's, had been transhipped to the s.s. "Orient," bound for Bombay.¹

No regular boat left Aden for Djibouti before the 22nd, so we received authority to charter Messrs. Cowasjee Dinshaw's s.s. "Falcon," which was leaving for Berbera on the night of our arrival, and would take us on from there to Djibouti for Rs. 300, and Rs. 5 extra for each servant. On Duff's advice I provided myself with 100 Maria Teresa dollars for use in Abyssinia, at a cost of Rs. 141.8. We arrived at Berbera on the 20th, went ashore in dhows, paid our respects to the Commandant (Major Rawlins), and dined, by invitation, at the Base Hospital, Major Gee, I.M.S., in command. The Somaliland Field Force, including all arms—British, Indians, and Somali levies—roughly numbered 6,000 fighting men, and about 18,000 all told, including coolies, &c., with two General Hospitals of 300 and 200 beds respectively, two British and three Indian Field Hospitals, as well as two additional sections of British Field Hospitals, of which fuller details later. There were many bad cases of scurvy in camp, especially among the Bombay native troops. The camp lay to the west of the jetty, or ramp, and the native town of Berbera to the east. Beside the first stonework wharf is a bamboo-built pier of flimsy construction. The whole place was a hive of industry, and the word wonderful hardly expresses the harmony of its working. The conglomeration of British and Indian soldiers, native levies, camp followers, camels, mules, ponies, donkeys, sheep, mule wagons, pony carts, camel carts and the rest, formed a bewildering picture of colour and activity. Big ships were discharging into lighters and dhows, thousands of natives of all sorts and colours, laden with cargo, were buzzing and humming like so many bees, or they were working like ants, rather, at giant ant-hills of compressed forage and sacks of oats, going and coming, passing and repassing, hurrying on and returning, they

¹ A message was received at Harrar, October 29, 1903, that the packages had been found, were due at Aden on that date, and would be forwarded immediately.

seemed like streams of corpuscles in arterial and venous currents moving in response to some unseen systole and diastole. Whilst we were ashore the report came in that a British officer had been mauled by a panther at Bulhar, and Capt. J. W. Little, I.M.S., was ordered to proceed there on our boat to tend him. We left Berbera at midnight on the 20th, and arrived opposite Djibouti at 8 p.m. on the 21st. Nobody on board properly knew the entrance. However, we got through in the end right enough, and landed in the morning at eight o'clock.

The trains leave Djibouti for the railhead thrice weekly, and, as one had left the morning of our arrival, we had to wait until the 25th. Djibouti is far ahead of Berbera. By means of its 190 miles or so of railway it has snapped up a lot of the Berbera trade. We stayed at the Hotel des Arcades, a three-storied building. Our bedrooms were on the first floor and were approached by two flights of stairs, which it was as well to negotiate for the first time in daylight, seeing that no two steps were alike. On the afternoon following our arrival we called *en troupe* on the Governor, M. Dubarry, and accepted an invitation to dinner on the morrow. The European quarter of the town lies on a promontory but little above sea-level, with the sea lapping nearly all round. The native quarter is situated behind the European, and is barely above high-water level, indeed the ground there is regularly inundated in many places at high tide. It consists of rudely-constructed huts of mats, rags, sticks, dried grass, mud, &c. Dried sticks for firewood, which is as scarce here as it is in many places inland, dates and grain, constitute the chief merchandise. The sanitary arrangements are of a prehistoric sort, and it is certain, that were it not for the sun, that best of all sterilisers, the place would soon be unfit for human habitation. The market of the European town overlooks the native quarter from a height of from 10 to 15 feet. There were wooden shelters with fish and meat exposed for sale—exposed, that is, so far as they could be seen for the flies. There were other stalls on which were chiefly carrots, potatoes, grain, and a few melons. In the centre of the town is the square, "Place Menelik," the sides of which are mostly made up of shops belonging to the ubiquitous and indispensable Greek and containing every conceivable article of merchandise. There is a splendid road—a perfect bicycle tract, though a short one—with standard oil lamps along it about fifty yards apart, and a low wall on either side, leading from the town over a bridge which spans a little inlet of the sea, to the railway station. It is

made of madreporé coral, crushed and rolled. This part of Djibouti is generally a smart, clean little town; many of the houses are good and well built, particularly the Governor's, which was, I think, one of the best houses I had seen since leaving Suez. The drinking water comes from about five miles inland, and is pumped up and stored in reservoirs hewn out of the rock. None of us had time to visit the site, but M. E. Bastianelle, Agent for the Compagnie de l'Afrique Orientale, told me that the supply is practically unlimited, although it depends upon the amount of rainfall. He said there were no natural springs, and the collection of water is the result of percolation of the rain-water through the soil. It has a saltish taste owing to the presence of salts in solution, said to be magnesia. It is brought to the town in iron pipes and rises to the first storey level of the town houses; 67,200 gallons are delivered daily.

Beggars clamouring for baksheesh are as plentiful in Djibouti as elsewhere, and they are peculiarly frank in one respect. If their importunities are not rewarded they, thinking their appeal is not understood, exhibit an open hand half full of small change and point to it with the other. They seemed to wonder that the simple European should go away regardless, suspecting that they were not quite so poor as "by Allah!" they said they were.

We much appreciated the kindly hospitality of M. and Madame Dubarry and we did good justice to the generous fare. After dinner M. Dubarry made us a happy and most friendly speech, to which "Diplomaticus" (Baird) replied in his very best style. We met there M. de Carlan, Secretary to the Governor, Madame de Carlan and M. Bastianelle.

Our hotel accounts for the three days and nights, exclusive of tips, amounted to 40 frs. each. The cost of transport from Djibouti to railhead is £18 10s. per ton, and my lot of twenty-nine articles, comprising camp, hospital and field equipment, four months' rations and private baggage, weighed 14.77 cwt., and cost £13 13s. 3d. We had four dogs amongst us, which cost 10s. each.

The railway is a metre gauge, steel rails, iron sleepers and there were iron telegraph poles carrying two wires on the left-hand side going from Djibouti. Our train consisted of an engine, guard's van, 4 open trucks, one 3rd class, and two 1st and 2nd class combined carriages. As giving an indication of the amount of rolling and general stock in use on the line, it may be convenient to give a list of what was noticed at various places, excluding what constituted our train. The list, however, may not be complete, as two or three short naps occurred on the journey.

First, at Djibouti: 5 engines—3 working and 2 in a shed apparently undergoing repairs, 19 open and 13 covered trucks, 4 trolleys and 3 carriages (1st and 2nd class) with combined couplings and buffers. There were also two workshops and one large storage shed, about 15 by 30 metres. (2) At Daonauli: 1 shunting engine, 14 open and 1 covered truck, piles of iron sleepers and rails, and a crane on a travelling carriage. (3) At Mellow: 27 open trucks, 2 hand trolleys, 2 trucks fitted with cylindrical water-tanks, quantities of iron sleepers, rails, and trolley wheels on axles. At Dire Daouw (railhead): 2 shunting engines, one of them without wheels, undergoing repairs, 7 covered and 6 uncovered trucks. The station and offices at Dire Daouw give employment to twenty Europeans. Fourteen parties of railway gangers were noticed along the line, but there were probably more. Each party numbered six or seven natives, one of whom carried a rifle and mounted guard. They were under the supervision of a European, apparently, either French, Italian or Greek. Cardiff patent fuel is used on the railway. The railway is certainly a fine feat of engineering, and it is most unfortunate that at present it is far from being remunerative.

Our train left Djibouti at 6 a.m. Our passages had been booked and the baggage cleared the previous day, so that all that remained to do at the railway station was to pay for our dogs and light kit. This does not sound much, but the attendant excitement and uproar beggars description. English, French, Greeks, Arabs, Somalis, &c., all talked at once, dogs barked, many of the railway officials persistently blew horns, the engine whistled and let off steam, whilst crowds of yelling natives filled up every possible gap in the babel. Lieut. C. L. Hussey, U.S.N.A., going to Adis Ababa to negotiate a commercial treaty between Abyssinia and the United States, joined our party on the train.

Leaving Djibouti we crossed the desert plain and were soon amongst the maritime range of hills, with a big up-hill pull to K. 64. Sometimes, as a native was heard to remark, it was too much "puffy, pushy, pully, but no goey," or, as another was heard to remark, "engine, he broken winded, eaty too much coal and drinky too much water." At K. 71, patches of short tufty scrub begin to appear, showing the faint green of struggling vegetation. The ground there is red and littered with black volcanic boulders. Beyond this the boulders begin to disappear and the hillocks become less abrupt and more gravelly. At K. 78 some small cacti were noticed. Near K. 90 there is a strong post perched on the top of a rocky height, which commands

the railway and its approaches from all directions and there we see the Abyssinian flag—green, yellow and red in horizontal bands from above downwards—and enter Abyssinian territory. At Daonauli we stopped for lunch, and there I noticed some “dead sea apple,”¹ mountain ash and tamarind.

We had a capital spin from K. 120 to 125, either on the level or down-hill. After that it was up again and, at K. 127, we nearly looped the loop up-hill on a high semi-circular embankment. Near K. 133 the black boulders again appeared, and we caught glimpses, here and there, of large open plains of greyish earth covered with a short stubble, on which flocks of fat-tailed sheep (white with black heads) and goats and several camels were grazing. Thereabouts, too, I noticed six gazelles, a couple of jackals, one big bustard, and a lot of small white and coloured birds that I could not identify. About K. 170 we could fanc yourselves back again on the Karoo, with the dead level country all around, except that scores of camels were seen grazing in addition to the cattle and the thousands of sheep and goats. The ground there had plenty of daremo grass besides the tufty, scrubby growth noticed already. Just about that time “Bess,” one of our three lion hounds, tried to commit suicide by jumping out of the window. Ogilvy, however, gallantly captured her by the hind-quarters during the performance and hauled her back again, very dyspnoëic, but otherwise none the worse. At K. 263 a fringe of pine and other trees followed the serpentine course of the broad, deep river-bed, and a little further on the country became more densely wooded, chiefly, so far as could be seen, by mimosa trees of large timber. At this time the darkness abruptly came on and nothing more could be seen. We reached Dire Daouw at 7.11 p.m., having performed the journey from Djibouti in thirteen hours. There we met Major Cobbold (late 60th Rifles) and proceeded to M. Michael Michaelidis’s *locando*, our headquarters for the night.

¹ The green globular fruit of the “dead sea apple,” on being incised, exudes a juice of the colour and consistency of milk, which is an irritant, and I have known the Egyptian conscript in the Sudan to introduce it into his eye in order to set up inflammation in the hope of being invalided home.

ON RELIEF AND APPARENT ARREST OF DISEASE IN TWO CASES OF INOPERABLE CANCER.

By COL. T. LIGERTWOOD, M.D.,

Physician and Surgeon to the Royal Hospital, Chelsea,

AND JOHN A. SHAW-MACKENZIE, M.D. LOND.

THE following are brief notes of two cases treated in the infirmary of the Royal Hospital, Chelsea. In the first case, hypodermic injections of soap were given, originally recommended by Mr. John Holden Webb (Melbourne), on the theory of local injury, or of some defect or loss of soap in the biliary secretion permitting cholesterine to separate from the "living cell," and proliferation or cell cancer to start;¹ and in the second case, hypodermic injections of chian turpentine—a new method of administration, so far as we know, of the drug originally introduced by Prof. Clay, of Birmingham, in the treatment of cancer.²

CASE 1.—Carcinoma of the tongue, of seven months' duration, in an old soldier, late of the 31st Regiment, aged 73. Under the administration of 5 minims of a 1 per cent. soap solution, obtained from Messrs. Allen and Hanbury, commenced on December 4, 1903, injected subcutaneously into the arm and increased by 5 minims on alternate days, to full dose of 60 minims every fourth day, marked cessation of pain and of all fœtor resulted; ability to open the mouth and fairly protrude the tongue, and take minced meat, while the growth diminished from the size of a walnut to that of half a filbert; indeed, towards the end no enlargement or thickening was appreciable, and the local condition in marked contrast to the usual termination of tongue cancer. Unfortunately he was suffering from advanced cardiac and arterial degeneration, which throughout treatment was a cause of great anxiety, and on March 21 some œdema of the extremities appeared, passing into black gangrene of the left leg and foot, and he rapidly sank, without suffering. *Post-mortem* examination of the tongue showed it to differ very little from normal, but microscopic examination of sections through a small patch of ulceration which existed, together with a gland reduced in size under the ramus of the jaw to the last, demonstrated epithelioma.

CASE 2.—Epithelioma of the neck in an old Crimean and Indian

¹ "Cancer, its Nature and its Treatment," *The Lancet*, October 12, 1901, p. 976.

² *The Lancet*, 1880-1887.

Mutiny warrior, late A.H.C., and 13th Light Infantry, aged 73. There was a large, hard, fixed mass, ulcerating in places, over the middle of the right sterno-mastoid, extending up towards the mastoid process, under the ramus of the jaw and over the trachea in front. The head was tilted over to the opposite side; great pain was complained of, and swallowing was becoming difficult. It had commenced primarily as a pimple last November, attributed to rubbing of the coat collar, and was evidently growing. Medical history sheet clean. Microscopic examination of a small piece taken from the edge of the ulceration proved it to be epithelioma. On January 25, 1904, 5 minims of a 20 per cent. combination of chian turpentine in olive oil (sterilised), obtained from Messrs. Southall Bros. and Barclay (Birmingham), were injected subcutaneously into the arm, the dose being increased by 5 minims on alternate days, till 20 minims were given. The third injection of 15 minims was followed by a rise of temperature to 102° , returning to normal in the morning; while after 20 minims it rose to 103.6° , necessitating reduction in future to 5 and 10 minims once or twice a week, followed by a rise of temperature to 100° , or thereabouts. Briefly, in this case, all pain went from almost the first injection; the extensive redness of the surrounding skin, reaching to above the mastoid in one direction and on to the upper chest in the other, rapidly subsided, leaving a faint purple discolouration limited to the immediate neighbourhood of the growth; the ulceration decreased and the discharge assumed a purulent character, free from all smell; the head was no longer tilted and could be moved freely in all directions; the difficulty in swallowing passed away, and at the end of a month the mass had diminished astonishingly in all directions. At present date, May 30, the tumour, now about the size of a hen's egg, remains pretty stationary, but occasions no inconvenience; slight further shrinkage has continued from week to week, with purulent but inoffensive discharge from the ulcerated surface. Patient is in the convalescent ward and goes out regularly. A small injection is given occasionally, and the drug is also given by the mouth daily in small dose. A history of malaria forty years ago has been elicited, and this probably has something to do with the rise of temperature following the injections, and also since noted on their temporary omission.

Aware of disappointments with chian turpentine recorded in the past, its employment in this case suggested itself from the recollection of the complete recovery, in 1891, of a case of presumed and advanced cancer of the uterus in a patient under its internal

administration, subsequently to the opinion at the time of an eminent authority (since deceased), of the hopeless nature of the case, and its employment, hypodermically, from the encouraging results obtained from hypodermic methods of administration of other drugs in various directions at the present time.

Without venturing to offer an explanation of the result in Case 2, it seems to us to be associated with the repeatedly induced rise of temperature following the injections, some reaction being apparently requisite; while removal of the local inflammation is suggestive of the arrest of growth being due to the cutting off of its nutrient supply, as obtains in certain cases of uterine fibroid under iodine treatment. Unfortunately, no examination of the blood was made in this case before commencement of treatment, but in another case since under observation and treatment a marked increase in the white and polynuclear cells has been noted. No local trouble has followed these injections. An "all-glass" syringe (Burroughs and Wellcome) has been used, and the method followed has been to sterilise the syringe in separate parts, and needle by boiling before use; to wash the surface of skin at site of injection with some antiseptic lotion; to apply a piece of ice before insertion of the needle, which abolishes all pain; to first inject 5 to 10 minims of a 3 per cent. solution of β eucaine; to then separate the barrel of the syringe leaving the needle in position, and after waiting a minute or two inject the soap or chian turpentine solution, and, on completion and withdrawal of needle, to cover with small piece of antiseptic gauze.

Though no proper conclusion can be formed from two cases, the removal of some of the worst features—pain and fœtor in Case 1—independently confirms results in similar cases claimed by Mr. J. H. Webb for his method of treatment; and in Case 2 there can be no doubt that the removal of pain and fœtor, shrinkage and apparent arrest of disease, apart from the known restraining influence of advanced years, are direct results of treatment and supporting original claims for chian turpentine. In directing attention therefore to these cases it is hoped that further trial and investigation may be made of Mr. J. H. Webb's method of treatment,¹ and of the hypodermic administration of chian turpentine, in suitable cases of inoperable and recurrent cancer.

¹ In kind reply to request for further information and particulars since received, Mr. Webb, in noting further good results for his method of treatment—notably in recurrent breast cancer after operation—states that while the soap

Remarks by Col. Ligertwood.—Knowing of the work and interest my friend, Dr. J. A. Shaw-Mackenzie, has been taking in hypodermic methods of treatment, and having myself witnessed some of the results in cases under his care, I was induced to ask him to see these cases of cancer and undertake their treatment with me, the gratifying relief afforded in which compels me to wish to place them on record.

injections seem to succeed very well alone in certain cases, he recommends in others, in addition, the internal administration of the sodium tauro—and glycolates, "animal gum," or fresh purified ox-gall, and further notes the good effects of local application of soap in foul ulcerations.

Clinical Notes.

THREE CASES OF GUNSHOT FRACTURE OF THE ARM.

By A. J. EVANS.

Late a Civil Surgeon, South African Field Force.

THE following cases present certain features of interest, if only to show how an apparently hopelessly damaged arm can be saved under conditions of considerable difficulty. They came under my care while serving in No. 2 General Hospital, South African Field Force.

CASE 1.—This patient was one of the injured in the explosion of a five-inch howitzer gun at Helvetia, Transvaal, on May 17, 1901. According to his statement he was standing about twelve yards behind the gun when it was fired. On admission into hospital the next day the patient was very collapsed and, on examination, it was found that he had sustained a severe compound comminuted fracture at the lower end of the right humerus, as well as several superficial wounds of the body more or less severe, the right humerus, however, being the only bone broken in the body. On removing the dressings a large ragged open wound was disclosed on the outer side of the lower end of the arm quite two and a half inches in diameter, which was in a very dirty state and suppurating freely; the rest of the arm was much swollen and contused, evidently having been struck by a large piece of the exploded gun. After the wound had been irrigated the finger was introduced into the cavity, when small fragments of loose bone were felt in every direction, but as the patient was very collapsed the wound was at once dressed and a splint applied. Next day a skiagram was taken, with the appended result, showing very extensive comminution of the lower end of the humerus and the implication of the elbow-joint.

It was decided, rather than amputate, to endeavour to save the limb. On the fourth day after admission the patient, therefore, was anæsthetised and the cavity explored, six or seven loose pieces of bone were removed and large counter openings made at the back and inner side of the arm, drainage tubes inserted and an internal angular splint applied. The patient was afterwards dressed twice every day for a week, with free irrigation. At the end of a week the man was able to bear his arm in an arm-bath of boric lotion for eight hours each day, this was kept up for eight weeks, the wounds getting smaller, but still continuing to suppurate owing to some further necrosis of bone.

On July 25 he was again anæsthetised and several small necrosed pieces of bone removed and the unhealthy tissue scraped away. The arm was then dressed as before; from this date it began to heal and cicatrise. Eleven weeks after admission firm union had taken place, of

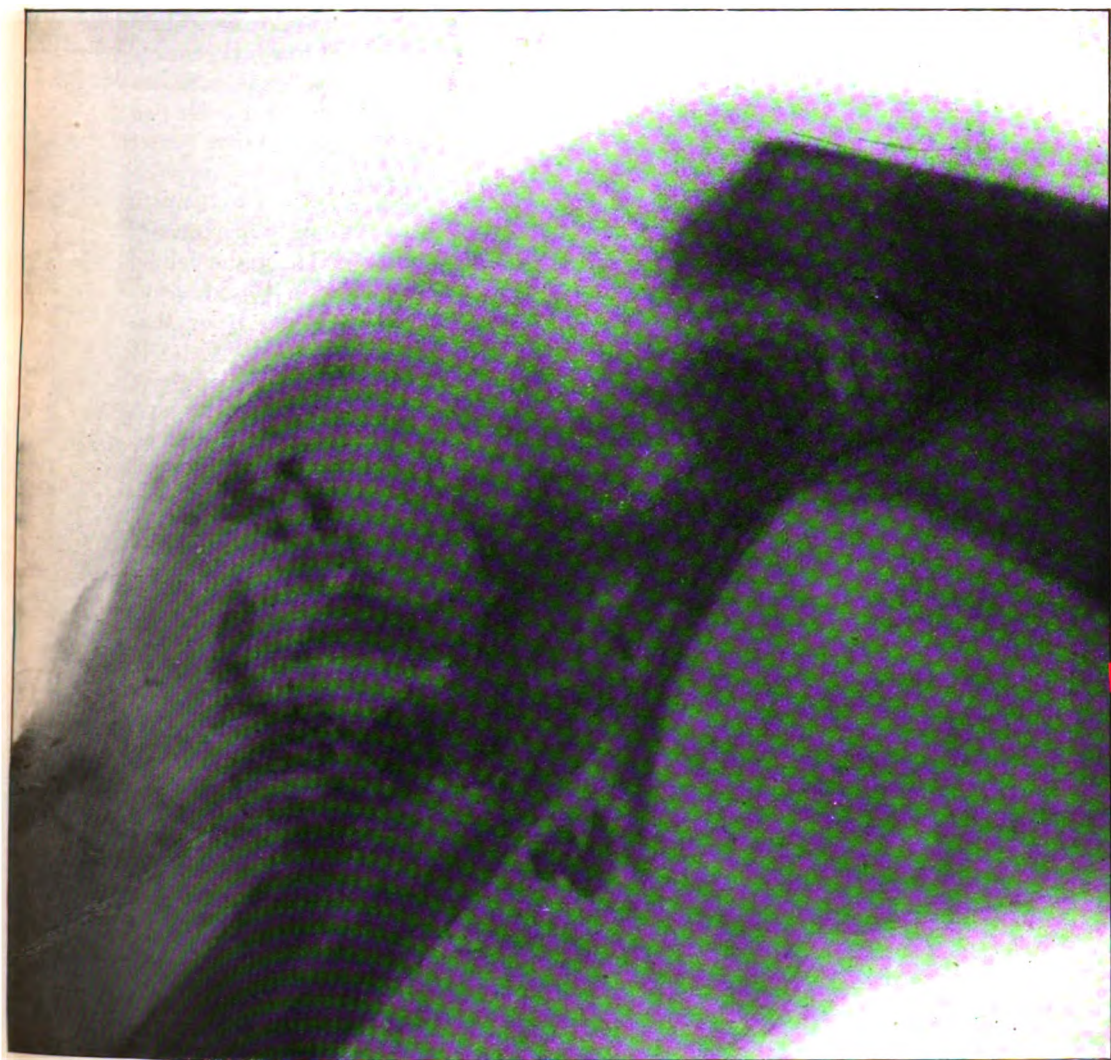
course with ankylosis of the elbow-joint, at right angles. On September 11, 1901, the patient was sent home with a very useful limb, the movement of the fingers being unimpaired. At some future date the movements of the elbow-joint may to some extent be regained by an excision.

CASE 2.—This patient, a trooper in "Morley's Scouts," was admitted into No. 2 General Hospital during the middle of October, 1901. He had been wounded on the day previous to his admission at close range (about sixty yards) during an engagement with the enemy whilst "rounding" up cattle near Pretoria. On admission the man was in a very collapsed state, evidently having suffered from extensive hæmorrhage. On examination the entrance wound was found near the outer border of the deltoid muscle close to its insertion, the wound being clean cut and about the size of a shilling. The exit wound was found two inches below that level and in the middle of the triceps muscle at the back of the arm. It was much larger and ragged, roughly about the size of a five shilling piece, and from it protruded a large mass of the muscle. The wound was evidently caused by a soft-nosed bullet. The large cavity on the back of the arm had fortunately been firmly packed on the field of action with iodoform gauze to prevent bleeding.

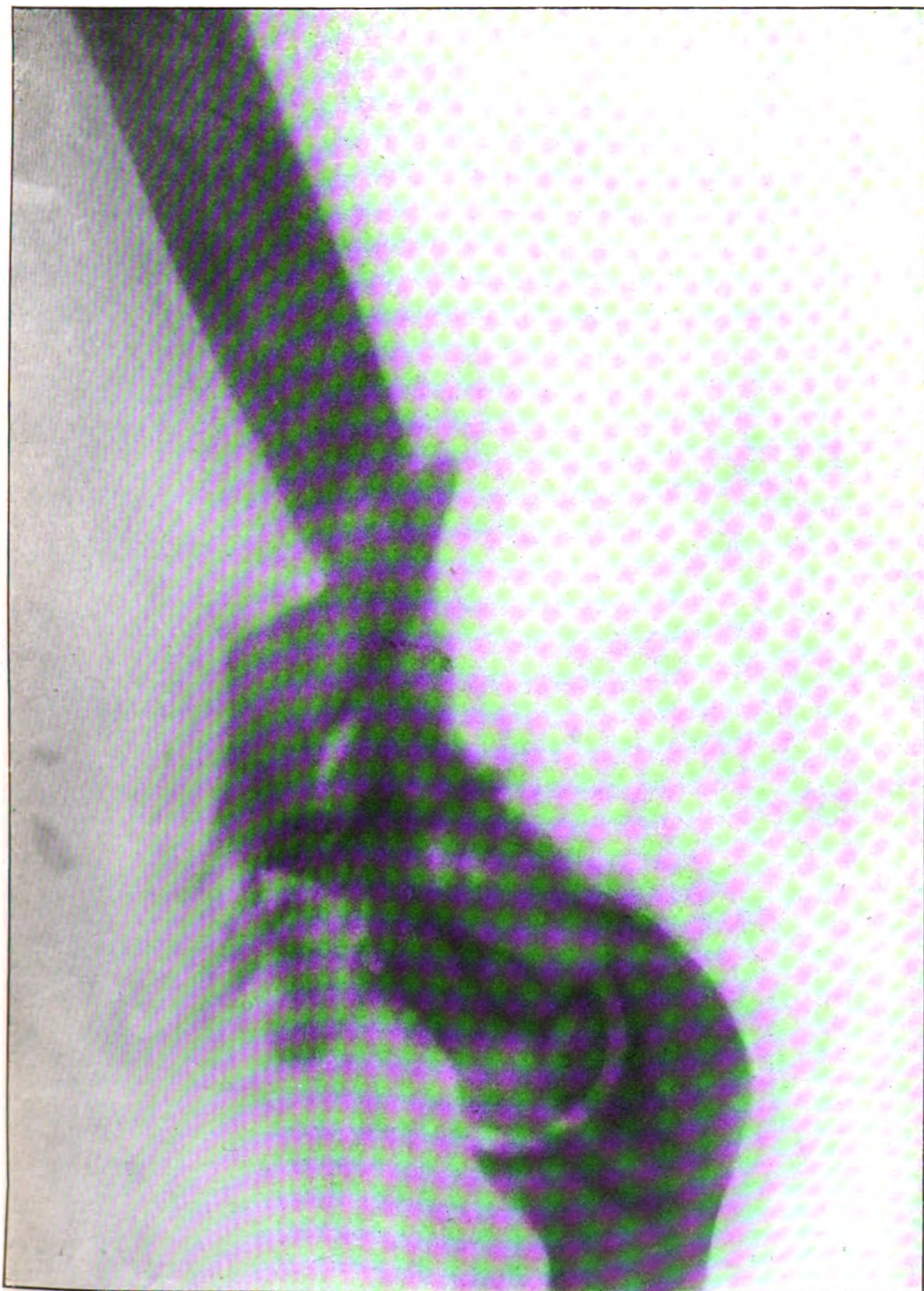
On removing the packing severe comminution of the bone was at once evident, as the cavity was filled with fragments of bone which had completely detached from the main shaft. The wound was repacked and a firm internal angular splint, together with small side splints, applied. The wound itself was in a very dirty state and suppurating very badly. An X-ray photograph was taken before the splints were applied. No hæmorrhage had occurred during the dressing of the wound.

Twenty-four hours after admittance severe secondary hæmorrhage occurred from the exit wound, and it was at once evident that the artery involved was the superior profunda. Owing to the dirty state of the wound and the extensive comminution of the bone at that point, it was thought safer to tie the third part of the axillary artery, so the patient was immediately anæsthetised and this was done, and the hæmorrhage was controlled at once. Counter openings were then made in the arm to drain any accumulations of pus, drainage tubes inserted and splints readjusted. The wounds were then dressed twice a day for three weeks, the suppurating cavity being freely irrigated out with 1 in 40 carbolic lotion, the wound over the axillary artery healing by first intention.

The patient made a very rapid recovery, and both exit and entrance wounds were healed in three weeks. It was thought at first that the musculo-spiral nerve had been involved in the fracture, as the patient had decided wrist-drop and inability to pronate or supinate the forearm; but this, however, disappeared as union took place, and the nerve has not even shown any signs of being involved in the extensive callus formed around the fracture. Passive movements were begun two months after fracture, and three months after being wounded the patient was able to



To illustrate "Three Cases of Gunshot Fracture of the Arm," by A. J. EVANS.
CASE I.



To illustrate "Three Cases of Gunshot Fracture of the Arm," by A. J. EVANS.
CASE III.

dispense with the sling which supported the arm. He was then discharged from hospital, the functions of the hand and forearm being almost perfect. The shortening in the arm amounted to $1\frac{1}{2}$ inches. The patient then entered civil employment, and nine months after being wounded came to me again, he having met with an accident on the railway and unluckily fell on his injured limb, which he thought he had rebroken. However, on examination no evidence of fracture could be found. The patient told me he could ride, drive, or play billiards without any inconvenience, but was not able to completely extend the forearm, owing probably to the extensive damage done to the triceps.

CASE 3.—This patient was wounded during an engagement with the Boers at Noigedacht on December 13, 1900. After being wounded he fell into the hands of the enemy and was without attention for three days. On admission to No. 2 General Hospital on December 17, the patient was in a very collapsed state, the arm was roughly fixed in an improvised splint, there was a large entrance wound in the back of the arm two inches above the elbow-joint, the exit wound being on the same level in front of the arm. From both wounds pus poured away in large quantities on removal of the dressings. The whole arm was greatly swollen, the forearm and hand puffy and œdematous.

On the day following admission the patient was anæsthetised and the wound explored, a skiagram having been taken previously, which is appended. There was no attempt at union and the lower third of the humerus was felt to consist of a mass of loose comminuted pieces of bone extending right down to the elbow-joint, which was full of pus. It was decided, however, to save the limb if possible; large counter openings were therefore made and drainage tubes of large calibre inserted, all the necrosed pieces of bone being previously removed and the wound freely irrigated out with 1 in 40 carbolic lotion. An internal angular splint was applied to the arm, which was fixed at right angles. Wounds were then dressed twice daily for three weeks, and several necrosed pieces of bone withdrawn through the wounds whenever they were found to have separated. At each dressing the cavity was freely flushed out with 1 in 40 carbolic lotion.

At the end of three weeks the patient was able to bear his arm in an arm-bath of boric lotion for eight hours each day, and under this treatment the swelling and œdema of the limb rapidly subsided and suppuration ceased. Two months after admission the wound had completely healed and the patient was able to dispense with the splints and support his arm in a sling; union was complete in ten weeks, with rigid ankylosis of the elbow-joint. There were no signs of involvement of any nerve in the wound or callus. The patient was sent home after having been three months in hospital, with a fairly useful limb, which at some future date will probably be made more servicable by an excision of the elbow-joint.

COLUMNAR CARCINOMA OF THE STOMACH IN A
MAN AGED TWENTY-EIGHT.

BY LIEUT. W. W. BROWNE.

Royal Army Medical Corps.

DRIVER ———, aged 28, of fairly temperate habits, was admitted to hospital on February 3, 1904, complaining of slight constipation and some aching pains across the loins. His history was as follows: On January 27 he began to get constipated and had slight pains across the loins. He continued to do his duty until February 2, 1904, when he reported sick, as he noticed that his abdomen was getting swollen and that he was losing flesh. Immediately after reporting sick he vomited twice, the vomited matter being greenish and sour. He had previously never had trouble with his bowels. He had a total service of eleven years, and his medical history sheet showed nothing important except syphilis seven years ago, followed by secondaries later. There was no family history of malignant or tubercular disease.

On admission he looked wasted and ill. He vomited once, the vomitus not being stercoraceous. His temperature was 100·2° F., and he passed flatus and a small scybalous motion. Examined on February 4, 1904, the abdomen was moderately distended, the transverse colon being particularly prominent. There was no tenderness, no dulness, and nothing could be felt. The rectum was loaded with scybala and nothing could be made out. The liver appeared to be displaced upwards, but no enlargement could be determined. Lungs, &c., were normal. Above the left clavicle was an enlarged lymphatic gland, hard, but freely movable. On the 5th the condition was much the same, and after an enema a rectal examination was made. A large, tender, rather hard, indefinite mass was felt to the left of and above the rectum. The finger could not be passed high up into the bowel. On the 6th the rectum was again examined and quite a different mass felt, which was slightly nodular, in front of the rectum, but well above the prostate. There was some resistance to the introduction of a sound into the bladder, and a mass moved with it. Intestinal obstruction from sarcoma at the junction of the sigmoid with rectum was diagnosed. Exploratory operation was discussed, but not thought advisable. From the 6th to the 15th, though the patient passed flatus and small stools daily, he got steadily worse and his abdomen became more distended. Attempts were twice made to pass a rectal tube. An exploratory operation was then decided on.

On the 16th, under chloroform, a rectal examination was made, and about three or four inches from the anus there was a constriction admitting one finger, through which a rectal tube was with much difficulty passed, and the colon freely irrigated for about twenty minutes. The distention did not subside, and very little flatus escaped. A large, very indefinite swelling could be made out in front of the rectum. An attempt

to relieve the distention by tapping the transverse colon with trocar and cannula failed. The ascending colon was then tried, but the gut was pushed aside and about forty-four ounces of blood-stained fluid escaped. The patient's condition being bad, it was decided to postpone further operation. The patient rallied from the anæsthetic well and was much better on the following morning, though a lot of fluid had collected in the abdomen. During the evening he suddenly collapsed and died.

Post mortem.—On opening the abdomen a large amount of fluid escaped. The great omentum was enormous, and was infiltrated with growth. It was adherent to and filled up the recto-vesical pouch, partially constricting the rectum. There was a large growth on the posterior surface of the stomach at the small curvature, close to the pylorus, but not involving it. There was no ulceration of the stomach. The mass was firmly adherent to and involved both liver and pancreas. In the former were numerous secondary deposits. The small intestines were slightly matted together. The pelvis of the left kidney was dilated, the ureter being involved close to the bladder. There were secondary growths in the lungs and lymphatic glands of thorax and abdomen. A lymphatic gland above the left clavicle, close to the junction of the internal jugular and left subclavian veins, and firmly adherent to the former, was enlarged and hard. Sections of the primary growth and cervical lymphatic gland show typical columnar carcinoma. The more interesting points were: The age of the patient, *i.e.*, 28. The entire absence of gastric symptoms. The enormous size of the growth and secondary deposits, especially in the great omentum. The rapid onset of the final symptoms. The lymphatic gland above the left clavicle, and whether this was infected through the thoracic duct. The difficulty of diagnosis. Though examined by many medical officers, no one suspected the extent of the mischief.

DIRECTIONS FOR PRESERVING FILARIÆ.

By GEORGE H. F. NUTTALL, F.R.S.

EMBRYOS IN THE BLOOD.

(1) DROP blood into a solution of 1 in 4,000 perchloride of mercury in 8 per cent. saline. Mix by shaking, cork and send without more ado.

(2) Drop blood into solution of iodine added to 8 per cent. saline, in quantity sufficient to give saline a pale sherry colour. Mix, cork and send.

(3) Drop blood into 10 per cent. boiling formalin solution, allow sedimentation to take place, then decant and preserve in 5 per cent. formalin.

(4) Make blood smears on cover-glasses, dry, pack them back to back, surround with thin paper (paraffined better), put into small box into which paraffin, melting at not too high a temperature, say 50—60° C., has been poured. Now pour in fresh melted paraffin so that cover-glasses lie in a block of paraffin.

Note.—I have devised this method in the hope that it will work with films collected in the Tropics, excluding their growing mouldy and altering with regard to stains. I should like to see it tried.

ADULT FILARIÆ.

(1) Place worms in saturated perchloride of mercury for twenty-four hours, then rinse with water for thirty minutes, and place in 70 per cent. spirit to which a little iodine has been added, so as to give it a sherry colour. Cork and send.

(2) Place worms in dish, pour on boiling saturated perchloride, rinse as before and store in iodinised 70 per cent. alcohol.

(3) Drop worms direct into 4 per cent. formalin in 8 per cent. saline ; cork and send.

The different methods can be used according to the convenience of the worker.



Editorial.

MALARIAL FEVERS AMONGST BRITISH TROOPS.

In the Army Medical Department Report for 1902 four new abstracts have been added to the usual tables, their purpose being to facilitate the comparing of the health statistics of the different military commands, by bringing together the statistics relating to the incidence of disease, mortality and invaliding in the Army at home and abroad. A glance at these tables shows the very prominent place occupied by malarial fevers as a cause of sickness amongst the troops, and in view of the activity with which anti-malarial measures are being employed where such fevers are prevalent, in our own military stations as elsewhere, the time would appear to be an opportune one for considering briefly the extent of the preventive problem with which the Army medical officer has to deal.

The Report for 1902 informs us that, out of a total of 191,250 admissions to hospital during that year, malarial fevers caused 22,501 admissions, with 68 deaths, and necessitated the invaliding of 513 men, of whom 46 were ultimately discharged as unfit for further service. The admission ratio for the year was 88·5 per 1,000, which may be regarded as satisfactory when compared with 131·1 per 1,000, the average rate of the preceding ten years. The death-rate was ·24 as compared with ·32 per 1,000, the decennial average rate.

The number of admissions does not give an exact indication of the number of infected individuals as, owing to relapses, the same man may be admitted two, three, or even more times during the same year.

Abnormal statistical conditions may arise in a station or command from movement of troops. Thus, if a regiment be moved from a station where malarial fevers prevail to a station either free or comparatively free from them, the statistics of the latter begin to show a malarial prevalence, for which the station is in no way responsible. For example, Bermuda is ordinarily quite free from the disease, yet in 1901 and 1902 its sick returns show many admissions for malarial fevers, and these admissions occurred amongst men of the 2nd Battalion Royal Warwickshire Regiment, who had contracted the disease in South Africa, at Komati Poort. In the same category must be placed the admissions occurring at Home stations, Gibraltar, Malta, Canada, and perhaps also Egypt and Barbados. Again, the admission rate for malarial fevers at

Singapore rose from 224·1 per 1,000 in 1897 to 829·9 per 1,000 in 1898, and this large increase in prevalence was attributed to the arrival of the West Yorkshire Regiment in a badly-infected state from the more malarious station of Hong Kong.

The following table gives the distribution of the disease by military commands, which are placed in order of prevalence, as indicated by the ratio per 1,000 of admissions during the year:—

		INVALIDS				Average Number con- stantly Sick	RATIOS PER 1,000			
		Admis- sions	Deaths	Sent Home	Finally Dis- charged		1902		Decennial Period, 1892-1901	
							Admis- sions	Deaths	Admis- sions	Deaths
Malta Command	{ Malta, 46 ad- missions; Crete, 1,036 ad- missions	—	—	—	—	—	—	—	—	
		1,036	1	2	—	—	2252·1	—	†721·26	—
Western Africa ..		312	2	3	1	8·83	1695·7	10·87	1634·0	17·29
China (Hong Kong) ..		1,523	6	24	—	46·55	1102·8	4·34	505·0	3·06
Barbados Command	{ Barbados, 16 admissions; St. Lucia, 190 admissions, 3 deaths; Antigua, 193 admissions	399	3	2	—	11·27	410·5	3·09	83·1	1·69
Straits Settlements ..		196	2	4	—	7·20	400·8	4·09	224·4	·78
Mauritius		5157	—	4	—	9·03	369·4	—	479·9	2·84
India		13,367	45	245	13	560·14	253·8	·74	349·9	·74
Jamaica		29	—	—	—	1·23	48·1	—	66·7	1·22
Ceylon		94	—	5	2	3·41	46·6	—	130·9	·86
Bermuda		77	—	28	—	6·83	37·5	—	16·8	·15
South African Command	{ Cape Colony, 94 admis- sions; Natal, 328 ad- missions; Transvaal and Orange River Colony, 1,342 admissions	1,764	2	167	1	110·53	31·4	·04	—	—
Gibraltar		87	—	1	1	2·54	18·9	—	7·7	—
United Kingdom ..		643	4	—	28	31·57	6·9	·03	6·9	·02
Egypt		13	—	—	—	·35	3·0	—	26·0	·02
Canada		3	—	—	—	·11	1·7	—	1·4	—
On board ship ..		755	3	—	—	—	47·3	·19	60·0	·41
		22,501*	68	485	46	—	88·5	·24	131·1	·32

* The total given refers to admissions among the men only. It would be considerably increased if the figures for officers, women and children were added, and it does not include the admissions among the non-European troops.

† The admission ratio for the seven years' period 1897-1903.

Jamaica and Ceylon may be classed as stations always presenting a moderate degree of malarial prevalence.

St. Lucia has a present and Antigua an old malarial reputation. A detachment of infantry (317 men) was quartered in the latter from May 13 to July 23, 1902, and a sharp malarial outbreak (193 admissions) occurred amongst the men.

The prevalence of malarial fevers observed in the South African command is due to disease contracted by troops serving in malarious districts during the war. It is not expected that the South African statistics will figure largely in the future under peace conditions.

British troops have been stationed in Crete since 1897, and it has proved to be a highly malarious station, the average admission ratio for the seven years' period, 1897-1903, being 721·26 per 1,000. The disease was specially prevalent in 1901 and 1902, when the admission ratios were respectively 2469·8 and 2252·1 per 1,000; the previous highest having been a ratio of 681·9 in 1898. The admission ratio for 1903 was 541·4. A paper on preventive measures against malaria in Crete, by Major J. V. Salvage, R.A.M.C., appeared in the May number of the JOURNAL.

The admission rate for 1902 on the West Coast of Africa, 1695·7 per 1,000, is higher than in the preceding year, and is also rather higher than the decennial average. The admission ratio for 1903 was 1308·0.

The admission ratio at Hong Kong for 1902 was the highest hitherto recorded at this station, namely, 1102·8 per 1,000, which is rather more than double the decennial average rate. The previous highest admission ratios were 603·7 in 1901 and 593·6 in 1890. Malarial fevers were less prevalent during 1903, as indicated by an admission ratio of 768·0, and the diminution is ascribed to the anti-malarial measures employed.

Mauritius, which in former years had a high malarial notoriety, has shown a diminished prevalence of the disease since 1896. The highest ratio recorded during the last twenty years was 1477·6 per 1,000 in 1885, and the lowest during the same period was that observed last year (1903), 150·1 per 1,000, the previous lowest having been 207·4 in 1900. This remarkable diminution in malarial prevalence is probably chiefly due to the fact that the men are kept away from Port Louis and Fort George as much as possible, and particularly in the fever season.

The systematic employment of preventive measures has been commenced in those of our colonial stations where malaria is rife, but sufficient time has not yet elapsed to enable a definite pro-

nouncement to be made as to results. Hasty conclusions should not be drawn from decreased admission ratios. Examination of the last twenty years' statistics of malarious stations in different parts of the world shows, in all instances, remarkable variations of malarial prevalence, some years showing high rates, others comparatively low rates, and that at periods when the decreases could have no relation to anti-mosquito measures. Relapses, variations in the susceptibility of individuals, arrivals and departures of infected troops, quinine administration, varying rainfall and temperature, and other conditions favourable or unfavourable to mosquito propagation, all have a part in bringing about a high or a low admission rate, and must always be considered with regard to their bearing on the results obtained from active anti-malarial measures. A low admission ratio following upon a high one cannot, therefore, by itself, be depended on as proof of the success of special measures, but, on the other hand, diminished ratios extending over a series of years would be evidence of great value, and, of course, diminished prevalence of the disease must eventually be the standard by which success will be judged. Earlier and more exact indications than can be hoped for from consideration of admission ratios alone are undoubtedly to be desired, and accordingly, additional proofs of success may be sought for in the following directions :—

- (1) Reduction in the endemic index obtained from observations of the percentage of native children (under 10) showing malarial infection: (a) parasites in peripheral blood; (b) enlargement of spleen.
- (2) Reduction of the percentage of men among the troops showing blood infection.
- (3) Reduction in the number of malaria-bearing mosquitoes: (a) larvæ; (b) adult *Anopheles*.
- (4) Reduction in the sporozoit rate, *i.e.*, percentage of mosquitoes having sporozoites in the salivary glands (Stephens and Christophers).

More than two-thirds of the total admissions for malarial fevers during 1902 occurred in India, and it is consequently in that country that the Army medical officer is afforded the greatest scope and most opportunities for working at anti-malarial problems. The importance of the work to be done in India, and the benefit that will result to the health of the British soldier if preventive measures succeed, will best be appreciated by considering the actual figures for the year. Out of the 22,501 malarial admissions for the whole army, India's share was 15,367, with 45 deaths; and 245 men were

invalided home, 13 of whom had to be discharged eventually as unfit for further service. Malarial fevers caused 23 per cent. of the total admissions from all causes in 1902, as compared with 27 per cent. in 1901. In addition to the admissions among the men, there were 419 admissions among the officers, 393 (5 deaths) among the women, and 623 (9 deaths) among the children. Malarial fevers were even more prevalent in the native army, as they were the cause of 35,580 admissions, giving an admission ratio of 286·4 per 1,000, as compared with 253·8 per 1,000, the admission rate for European troops.

Confining our remarks to the disease as observed among the European troops, 42 stations showed decrease and 28 increase in the admission ratios for 1902. The highest admission rates for that year were 1141·7 for Mandalay, 972·0 for Fort Attock, 930·4 for Fort Lahore, 897·1 for Deesa, and 895·5 for Saugor. Among stations showing decrease, Mian Mir occupies the most prominent position with an admission ratio of 269·5 per 1,000, as compared with 1354·0 in 1901, a decrease of 1084·5. This cantonment had been examined by the Royal Society's Commissioners in 1901, and vigorous anti-malarial measures were carried out during 1902. A full account of the measures¹ adopted is given in the reports to the Malaria Committee of the Royal Society by Messrs. Stephens and Christophers, and by Capt. James, I.M.S.

Capt. James states in his part of the report (page 71):

"It is generally agreed that the year 1902 was an exceptionally healthy one for all troops in the Punjab, and for this reason it was an unfavourable one for testing the efficacy of prophylactic measures by means of hospital statistics."

After giving tables showing the decrease for 1902, he goes on to say that it is difficult to determine accurately the factor to which most credit should be given for the great decrease in the admission rate, a decrease which was even more notable in the British infantry lines where no operations against mosquitoes were carried on, than in the Royal Artillery lines which were within the area of operations. The admission rate for the Royal Artillery was 384·0 per 1,000, against 234 per 1,000 for the British infantry. The low admission rate among the infantry is attributed in large measure to the prophylactic issue of 10 grains of quinine twice weekly under strict supervision.

In discussing the respective value of the different methods of prophylaxis attempted in Mian Mir, Capt. James states (p. 75):

¹ See also JOURNAL OF THE ROYAL ARMY MEDICAL CORPS, Vol. II., page 70.

"From a practical point of view the chief drawback to mosquito destruction is its difficulty and expense. It must be admitted that although we have been given, practically speaking, a free hand in matters of expenditure and in the amount of labour employed, and although my own services and those of a hospital assistant have been confined exclusively to this work, we have, during the summer, made but little impression on the number of *Anopheles*. It remains to be seen what the results of the winter operations and those of the coming summer will be."

We are now able to add to the tables in Capt. James's report the figures for 1903, and in the case of the monthly table the ratios up to April, 1904. These figures give the results of the continuance of this large scale experiment, and it is much to be regretted that they are not of a more favourable nature. They may be of more than passing interest to those who propose to take part in the discussion on malarial fevers at the forthcoming meeting of the British Medical Association.

TABLE I.—STATEMENT OF THE ADMISSIONS FROM MALARIAL FEVERS AMONG THE BRITISH TROOPS AT MIAN MIR FOR THE SIX YEARS 1898 TO 1903.

Years	Average Strength	Admissions	Ratio per 1,000
1898	869	702	808
1899	853	400	469
1900	814	871	1,079
1901	808	1,094	1,354
1902	731	197	269
1903	821	846	1,030

The monthly table, completed to April, 1904, is as follows:—

EUROPEAN TROOPS AT MIAN MIR. MALARIAL FEVERS (AGUE AND REMITTENT).
Admitted per 1,000.

Years	Jan.	Feb.	March	April	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.
1892	56.8	41.4	46.7	40.3	55.6	62.2	57.3	149.3	110.9	165.9	196.7	123.5
1893	54.2	35.0	55.4	41.2	74.6	109.7	156.9	142.6	81.0	134.3	102.4	88.3
1894	49.1	14.1	7.4	3.9	56.1	58.1	85.3	146.0	203.9	332.5	223.5	193.0
1895	118.2	84.1	106.3	189.1	152.9	174.9	143.9	127.6	125.0	148.0	166.4	32.7
1896	12.1	3.9	6.7	14.1	10.8	43.5	33.7	9.6	47.2	87.5	37.0	28.9
1897	10.6	17.2	23.5	12.5	14.9	15.2	23.5	19.8	106.0	58.4	284.8	186.9
1898	84.5	33.6	30.4	45.0	68.9	5.2	24.0	10.8	88.8	209.1	126.0	97.8
1899	33.0	37.6	38.6	36.8	80.7	56.7	50.8	29.8	58.2	49.9	18.0	6.6
1900	15.4	9.0	21.7	24.5	11.1	16.2	9.3	29.7	138.8	356.4	261.3	229.1
1901	152.0	68.3	69.5	63.4	159.4	141.4	63.5	126.9	153.1	219.8	134.3	62.8
1902	20.9	32.8	22.2	12.2	22.1	19.7	6.8	1.7	3.4	37.2	33.7	35.5
1903	7.2	.9	5.8	9.5	4.0	13.5	9.5	46.2	148.7	233.2	316.1	213.4
1904	92.4	43.2	45.6	23.5	—	—	—	—	—	—	—	—

Anti-malarial measures were in operation during 1902 at most

stations in India, and in nearly all cases where decrease was observed the decrease was attributed, partially or wholly, to measures taken to prevent the breeding of *Anopheles* mosquitoes. In view of the difficulty of determining the exact measure of value to be attached to the extensive and carefully carried out operations at Mian Mir, the uncertainty attaching to the measure of success claimed at other stations is abundantly evident, as all of the claims are based on decrease of the admission ratio for 1902 only. In a recently issued circular letter, the Principal Medical Officer, H.M.'s Forces in India, enjoins all medical officers to devote the closest possible attention to the prevention of malarial fevers, and instructs them to carry out the various measures recommended in this connection with the greatest care, constancy and patience. He points out that failure may result from want of continuous and organised effort, the non-employment of a special medical officer in the work, and want of funds. This letter also contains the following instructions with regard to the preparation of the annual report :—

In furnishing the annual report on malarial fevers, the following information should be invariably given—

- “(1) The type of fever noticed to prevail, stating number of cases of—
 - “(a) Benign tertian.
 - “(b) Quartan.
 - “(c) Malignant tertian.
- “(2) The months of greatest seasonal prevalence of each form.
- “(3) Whether any cases of hæmoglobinuric malarial fever were met with, and if their incidence bore any relation to treatment by quinine.
- “(4) The endemic index of the disease amongst the children of native followers living in close proximity to barracks or hospitals.
- “(5) The prophylactic measures taken for the personal protection of the men against malarial infection, stating the results achieved.
- “(6) The measures observed when dealing with men admitted to hospital suffering from malarial infection.
- “(7) The measures adopted against the *Anopheles* mosquitoes, in barracks, hospitals, followers' lines and out-of-doors, stating—
 - “(a) The species of *Anopheles* met with and its prevalence.
 - “(b) If *Anopheles* larvæ were found and under what conditions.

- “(c) The form of larvicide used ; tar, kerosine, &c., and the effect its use had on the incidence of malarial fever.
- “(8) The number of cases of malarial fever in which the initial infection was acquired at the station and of those in which it was acquired elsewhere.
- “(9) Whether any troops infected with malaria had lately arrived in the station.
- “(10) A full and complete report of the autopsy, whenever permissible by regulations, of fatal cases of malaria.”

Lastly, under the heading of debility, 4,351 admissions were returned in 1902, and many of these cases had, no doubt, a malarial origin. Every Army medical officer is familiar with the kind of case which formerly could be classed under “malarial cachexia.” The cases of ill-health resulting from malarial saturation, marked by anæmia, debility, and a characteristic dirty sallow appearance, with usually enlargement of spleen and often also of the liver, form a distinct group of cases which cannot be properly classified as ague or remittent fever. In the interests of statistical accuracy it is hoped that in the nomenclature, which is at present under revision, a place will be found for chronic malaria.

T. McCULLOCH.

UNDER the auspices of the Royal Society, a special Commission, comprising representatives of the Admiralty, the War Office, and the Colonial Office, has been appointed for the purpose of investigating problems connected with the etiology and spread of Malta fever. The Civil Government at Malta is represented by Dr. Zammit, and the Navy by Staff-Surg. E. A. Shaw, R.N., while the Military representatives are Colonel D. Bruce, F.R.S., R.A.M.C. (Chairman of the Advisory Committee of the Royal Society), and Major W. H. Horrocks, R.A.M.C., the Sanitary Officer at Gibraltar. The Medical Department of the Local Government Board has also detailed a member of their staff in connexion with the working out of epidemiological questions. The Commission is now working at Malta.

Echoes from the Past.

NOTES OF QUEEN VICTORIA'S VISIT TO FORT PITT AND CHATHAM.

By GEORGE RUSSELL DARTNELL.

Deputy Inspector-General of Hospitals, 1855-6.

PART I.

HER MAJESTY on her first visit drove from the railway station to Fort Pitt and alighted from her carriage at the front entrance of the Hospital; here she was met by the Commandant, myself, and the Staff-Surgeons of Divisions. Lord Hardinge presented the Commandant and myself, and after receiving the morning state of the Hospital, she desired that I should take place by her right hand, when she proceeded to inspect the convalescents from the Casements, who were paraded in line under the verandah. She then passed into the Hospital, taking each of the lower wards in succession. Each man stood, or sat (if disabled) at the foot of his bed with a card in his hand, on which was written his name, regiment, age, service, the nature of his wound or disability, in what action he was wounded, &c. She asked the wounded men several questions and seemed much interested in some of the cases, which were more particularly explained to her by Staff-Surg. Parry, who was introduced as Staff-Surgeon of the Surgical Division. The case of Pte. Thomas Walker, 95th Regiment, particularly claimed her attention, and also that of a young lad named Barrett; the former had been dreadfully wounded in the head by a shell which burst in the air immediately above him; the latter had been struck in the face by a canister shot, 13 oz. in weight, which had been firmly wedged in between the bones of the face, but extracted a few days before in a very skilful operation by Staff-Surg. Parry.

Her Majesty having previously expressed a desire not to go upstairs, all the Crimean men were paraded in the lower wards and in the verandah, but as she was about to leave the Hospital I asked if Her Majesty would not look at the upper wards, as they were the best part of the Hospital. Seeing that she hesitated, I said, "We have an old soldier upstairs, Your Majesty, a Scotchman, who has been confined to his bed for thirty-six years, and who is quite a character; possibly Your Majesty might have some curiosity to see him." She said, "Oh, I should like to see him very much."

On the upper landing she saw the soldier's library, about which she and Prince Albert asked some questions.

As the Queen and her suite passed up towards the farther end of No. 15 Ward, old George raised himself as well as he could in his bed and, without waiting for her to speak, immediately addressed her with: "God bless Your Majesty for deigning to come and see a poor old helpless creature like me that has been suffering for so many years with the *asthmatics*, and the *rheumatics*, and the *pleuratics*, and the *parlatics*; but I'm truly grateful to Your Majesty for your condescension. I weel remember Your Majesty's father, the late Duke of Kent, and I ken weel the time that I often seen Your Majesty yoursel' when you were a wee thing, 8 years old, running about Kensington Gardens. And this is Prince Albert, and these are Your Majesty's royal children, God bless them; and may I make bold to ask Your Majesty which is His Royal Highness the Prince of Wales? the eldest, I suppose" (a nod of assent). "Well, God bless him, too, and grant that he may be as good a man as everybody says his father is."

PRINCE ALBERT: "Well, George, I am told you have been a great many years here; I'm glad to see you have kept your health so well. How old are you?"

GEORGE: "I'm just 96, Your Royal Highness."

QUEEN: "Is that true, Mr. Dartnell?"

"I fear it is a little exaggerated, Your Majesty."

QUEEN: "I should think so," with a smile. "He is very old, though, no doubt."

"I believe he is above 90, Your Majesty."

QUEEN: "How many years have you been confined to your bed, George?"

GEORGE: "Well, Your Majesty, I suppose I have been about five or six and thirty years."

QUEEN: "Has he really been so many years as that, Mr. Dartnell?"

"To my certain knowledge, Your Majesty, he has been in bed since the year 1821, and I believe he was for some time before that."

QUEEN: "Dear me, how wonderfully well he looks even now."

"Yes, wonderfully well, indeed," I replied, "considering, too, all his real or fancied ailments; and I hope Your Majesty will look on the fact as a proof of the care we take of Your Majesty's soldiers in this establishment."

QUEEN: "A very satisfactory one, indeed." Her Majesty then

quitted the ward, bowing graciously to old George, with whom the whole party seemed greatly amused.

On leaving the Hospital Prince Albert said, "May I ask, Mr. Dartnell, if the Hospital is always as clean and nice as it is to-day?" I replied that he would find it in precisely the same state every day in the year. "Then it is very nice, indeed, nothing could be cleaner or more comfortable": and the Queen, expressing gratification that no special preparations had been made for her, I said "that I thought I should be consulting Your Majesty's wishes best if I permitted you to see the establishment in its real and every-day garb"; and "You were quite right," she replied.

Her Majesty now re-entered her carriage and drove to the temporary hospital in Brompton Barracks, where the Commandant and I, riding on ahead, were again ready to receive her as she alighted.

I took place by Her Majesty's right hand as before, and introduced Staff-Surg. Reade, in charge of the Hospital. The patients here also were all brought down to the lower wards, every one of which Her Majesty visited, expressing the greatest sympathy for the wounded, inquiring into all their cases; greatly interested in the histories of their several exploits, but distressed apparently beyond measure at the vast number of maimed and disabled men.

In one of the wards she took much notice of a fine-looking young soldier who was far advanced in phthisis. After leaving the ward she sent Col. Phipps back to tell the man that, if he wished, she would get him into the Consumption Hospital in London. Col. Phipps, on his return, said, "The young man desires me to say that he is extremely grateful for Your Majesty's kindness, but that he would prefer remaining where he is, as he is as comfortable as he could be anywhere." "I hope," I added, "that Your Majesty will look on this as another proof of the care taken of Your Majesty's soldiers in your military hospitals."

"It is very gratifying, indeed, Mr. Dartnell."

The convalescents from the Invalid Dépôt at St. Mary's were paraded for the Queen in the Officers' Mess House of the Brompton Barracks, which was then unoccupied; the wounded were classified in the different rooms, according to the battles in which they had been wounded, and on each door was tacked a card with the word "Alma," "Balaclava," or "Inkerman," printed in large letters.

The whole inspection occupied Her Majesty upwards of three hours, and she was pleased to express herself highly satisfied and interested in all the arrangements and in all that she saw.

Before stepping into her carriage the Queen said to me, "Mr. Dartnell, I wish you to send me, from time to time, the names of any badly-maimed men of good character, who you think would derive comfort from the use of artificial limbs, or other mechanical appliances of a more complete or expensive nature than those provided by the Government; and I wish you also to send me, as soon as you can, a return of all the men I have seen to day." "Your Majesty, I presume, means a return giving the name, age and service of every man, with a description of his wound and where received?" "Precisely."

On the occasion of Her Majesty's second visit to Chatham, early in June, 1855, the whole of the convalescents at Fort Pitt were paraded for her inspection in the pleasure-grounds in rear of the Hospital. She alighted from her carriage as before, at the front entrance, and went into the lower wards to see a few of the men who were unable to leave their beds; she then walked, leaning on Prince Albert, along the verandah and the front of the building, passing into the shrubberies by the ivied archway beside the Principal Medical Officer's quarters. Her surprise and gratification was very great at the beauty and neatness of the grounds and the tact that had been displayed in laying them out. Prince Albert said, "Are the invalids, Mr. Dartnell, allowed to walk in these grounds?" "Oh, yes, Your Royal Highness; they were laid out expressly for their use." "Do you mean to say," said Her Majesty, "that they are allowed to walk about here whenever they please?" "They have unrestrained liberty," I replied, "to go wherever they please, but of course within prescribed hours. In fine weather you would see them sitting under the shade of the trees, reclining on the grassy slopes, reading, conversing, smoking, and amusing themselves as they please." "Well," she said, "nothing could be more beautiful, or, I should think, better for their health. Pray, who was it laid out these grounds?" "They were planned and laid out by the purveyor, Mr. Pratt, who resided here for many years, and who found this fort, about thirty-five years ago, as I saw it myself, without a single tree, shrub, or green thing of any description within the walls." "Pray, Mr. Dartnell," said the Prince, "is not rheumatism a very common complaint with soldiers coming home from foreign service?" I said, "Yes, Your Royal Highness, a very common complaint, especially with invalids from the East and West Indies." "And, pray, what is your chief remedy for it?" "Why, Your Royal Highness, in these chronic cases we trust chiefly to change of climate, generous diet, and the pure air they

breathe here, which, I am sure, is more efficacious in restoring them to health than any medicine they could get." "I believe you are quite right, Mr. Dartnell."

The royal party now turning up towards the centre mound, Her Majesty found 200 convalescents drawn up at its foot, in a double line, the wounded being seated on forms in the front rank, each man having an explanatory card in his hand. On approaching the line, I said, "Your Majesty will perceive that every man, by his card, tells his own tale." Her Majesty then walked slowly down the front rank, looking at every man's card, speaking to or asking some question of almost every one, returning in the same way by the rear rank, and recognising several whom she had seen at her first visit.

The day was beautifully bright and fine, the mounds and slopes were covered with spectators, and the whole scene — the royal party, the staff and other officers in their uniforms, the maimed and weather-beaten warriors in their blue hospital dresses, with their wooden legs and crutches — was peculiarly imposing and interesting.

After inspecting a new, but clumsy and heavily-made ambulance in rear of the hospital, Her Majesty again entered her carriage and drove rapidly to Brompton Hospital, where the convalescents were drawn up, by a long range of barrack forms, along the whole length of the front of the building. Among these men, too, she recognised several she had seen before, displaying considerable power of memory. On reaching one of the men, she said, "I have seen this man before." "I hardly think so, Your Majesty," I replied (feeling quite certain in my own mind that in this instance at least she was mistaken). "Oh, yes," she said, "I am quite sure I did. Did I not see you (to the man) the first time I was here?" "Yes, Your Majesty, you did, I arrived here the day before." The Queen immediately turned round with rather an arch and comic look at me, as much as to say—you see, I'm right and you are wrong. "Indeed, Your Majesty," I remarked, "has a wonderful memory, I wish mine were half as good." Some of the cases of these poor fellows excited Her Majesty's interest and sympathy very much.

From Brompton she drove to St. Mary's, where she inspected upwards of 600 convalescents, drawn up in line. The answers of some of the men to her questions, and their mode of address, often amused her, as, for instance, one in replying to her would say, "Oh yes, ma'am"; another "Oh no, Miss—Your Majesty I mean," or "Your Highness." The poor fellows were so confused that they

hardly knew what they said, as often as not saying *no* for *yes*, or *vice versâ*. One man was asked a question by Lord Hardinge, and in the confusion of his thoughts addressed him as "Your Majesty"; the Queen heard this, turned round to his Lordship, and laughed.

After inspecting the men on the ground the Queen and party walked across to see the Casement Barracks, about which so much had been said and written of late. She went into one or two of the upper rooms and was quite horrified at them. "Are these really the barrack-rooms of these invalids?" I said, "Yes, indeed, they are Your Majesty"; and Prince Albert, looking over towards the splendid convict prison recently built in view of the casement barracks, said, "Well, it seems very extraordinary that there should be no difficulty in obtaining money to erect a magnificent building like that for convicts, and that it should be impossible to find the means of building a commonly comfortable barrack for our convalescent soldiers."

While here Her Majesty displayed another wonderful instance of her remarkable memory. Observing from the verandah, where she was standing, a soldier walk across the barrack square below, she said to Col. Eden (the Commandant) who was near her, "There is a man, Colonel, I have not seen before." "Oh, I think you must have Your Majesty, for every man in the barrack has been paraded for Your Majesty's inspection." "Well," she replied, "I am quite certain that man was not in the ranks." Col. Eden immediately called to the man to know if he had not been on parade a few minutes before: he said, "No, Sir, for I only arrived here after the parade was formed."

On her return to the railway station she turned in to look at Melville Hospital, with which she was very much pleased, remarking, "This is, indeed, something like a hospital."



Translation.

THE ACTION OF HUMAN SERUM UPON SOME PATHOGENIC TRYPANOSOMES AND THE ACTION OF ARSENIOUS ACID ON *TRYPANOSOMA GAMBIENSE*.

By M. A. LAVERAN.

In my former paper I showed that human serum injected in sufficient quantities into mice or rats suffering from nagana, mal de caderas, or surra, causes the trypanosomes to disappear, at least for a time, from the general circulation.

The dose used for a mouse weighing 20 to 25 grams is 0.5 to 1.0 cubic centimetre of human serum, for a rat weighing 200 grams, 2.0 to 3.0 cubic centimetres or 0.20 to 0.30 of a gram, of powdered dessicated serum.

The trypanosomes disappear in it, as a rule, after several days. Their disappearance is perfectly definite, but repeated injections only delay the animal's death, do not cure it.

In November, 1903, Drs. Dutton and Todd were good enough to send me, by Dr. Annett, two rats, one infected with *Trypanosoma gambiense*, and the other with Gambia horse trypanosome. It appears to me that *T. gambiense* is identical with the trypanosome of sleeping sickness. The study of this parasite then, from a medical point of view, is of great interest.

One would think, *a priori*, that *T. gambiense*, which develops in the blood of man, as well as other mammifera, would not be influenced by human serum in the same way as the trypanosomes of nagana, surra and mal de caderas, to which man is immune. This I have found to be true by experiment. Human serum injected in quantities of 0.20 to 0.30 of a gram of the powder into rats weighing 170 to 200 grams, infected with *T. gambiense*, is absolutely inactive.

At first, in rats infected with *T. gambiense*, the trypanosomes are very scarce in the blood, so that after a positive examination you frequently have negative ones, but in a month or a month and a half the trypanosomes become established and live in the blood in numbers quite sufficient to enable one to recognise easily the influence of any medicine used. That was the moment I chose for my experiments with sera or drugs.

The sera of guinea-pigs, sheep, and horses, like human serum, are shown to be without action upon *T. gambiense*. The reason is that the guinea-pigs, sheep, and horses are, like man, susceptible to this disease.

Manson has tried treating a case of trypanosomiasis with injections of horse serum, and he states that he failed; the result was to be foreseen,

as the horse is not refractory to the infection of *T. gambiense*. This trypanosome develops badly in the blood of the greater number of mammifera. I may own that the serum of a cynocephale, which appeared to have natural immunity against *T. gambiense*, showed itself as little active as the serum of animals which were susceptible to this trypanosome.

Experiments have also been made to try the serum of animals that have acquired immunity to *T. gambiense*, and also of those animals after hyperimmunisation, but the results of previous researches made in this direction, and with other pathogenic trypanosomes, left little hope in regard to definite results being obtained from these experiments. Human serum inactive against *T. gambiense* has, on the contrary, a positive action, though feeble, upon the Gambia horse trypanosoma. It is now proved that this last trypanosome ought to be completely separated from *T. gambiense*, from which it is distinguishable, not only by its morphological characters and its pathogenic action upon animals, but also by the further proof that it reacts in a different way to human blood serum. Human serum injected in a sufficient dose into mice and rats having the Gambia horse trypanosomes very numerous in their blood makes these trypanosomes disappear ordinarily in thirty-six or forty-eight hours. The parasites are, however, not long before they reappear again. In the case where trypanosomes are very numerous, the injection of human serum would only have the effect of diminishing the number of parasites. The action of human serum on it is certainly present, but more feeble than in nagana, surra, or mal de caderas.

Arsenious acid is the only drug that has given any favourable results in the treatment of surra and nagana. It would be interesting to try if it would be efficacious against *T. gambiense*.

The results of my experiments with arsenic on rats, given in a sufficient dose, show that the *T. gambiense* disappears from the general circulation, at least temporarily, and also that this drug can shorten the duration of the disease in these animals. The best dose is 0.1 milligram of arsenious acid for every 20 grams of animal weight; for example, 1 milligram for a rat of 200 grams. If a smaller dose than this is given the result is *nil*, or very incomplete.

In human trypanosomiasis arsenious compounds have been often tried, and they have only given slight amelioration, but in general the doses were too small. After the result furnished by the experiments on animals, one would say that the method of giving small doses daily of arsenious acid (the method employed mostly in treating human trypanosomiasis) is bad; it is better to prescribe large doses at longer intervals.

Writers agree in saying that human trypanosomiasis is always fatal after nervous symptoms have declared themselves, but before the appearance of these symptoms there is a period, more or less prolonged, during

which the trypanosomes, present in small numbers in the blood, produce little morbid trouble. In this first phase, it is probable that the infection produced by *T. gambiense* is curable in man, as it is in many species of animals, and that arsenious acid can help in the cure.

Good hygiene and good feeding are also important factors in the treatment of trypanosomiasis. In Africa sleeping sickness is specially severe, particularly in miserable travelling Negroes, jaded and badly nourished. The same thing is observed in animals that have been injured. Feeble animals take the infection more severely than well-fed animals in good health.

M. E. BRUCE.



REPORT OF THE ROYAL COMMISSION ON THE WAR IN SOUTH AFRICA.

As the actual volumes of this important report are unlikely to be accessible to the majority of members of our Corps, while the evidence contained in their pages cannot fail to be of interest to our readers, we propose giving a *précis* of the evidence so far as it relates to medical organisation before and during the late campaign. For this summary, which is continued from p. 622, vol. ii., we are indebted to Lieut.-Col. Edwin Fairland. It deals mainly with evidence regarding medical equipment.

VII.

(V.C.) Field-Marshal the Rt. Hon. Earl Roberts, K.G., &c., in the course of his evidence said :—

(Q. 10,485.) The next point is the medical service; have you any remarks to make about it? I think the Medical Department suffered under, perhaps, greater disabilities than the other Army departments. It was very far from being prepared for expansion, and yet within a few months it was called on to supply officers, N.C.O's, orderlies and nurses for an Army three or four times the size of that for which its establishment had been estimated as sufficient. It had been calculated that it would be enough to arrange for medical aid for 4 per cent. of the troops employed in war, whereas it turned out that the calculation should have been for 10 per cent. Nevertheless, had it not been for the sudden outbreak of an epidemic, which is inevitable in war, the Department would in all probability have proved equal to the occasion, and that the outbreak should have reached dimensions with which we were unable to cope was due rather to the arduous character of our operations, and the nature of our lines of communication, than to want of efficiency and zeal on the part of the medical officers and their assistants. It was impossible, under the circumstances, to give the medical supplies precedence on the railway, and to bring up reinforcements of *personnel*. The experience of former wars has shown that, during the vicissitudes of a long and arduous campaign, the victims claimed by disease are far more numerous than those that fall from the enemy's shot and shell; and the records of history tell of appalling losses from sickness, often from preventible causes. In the Crimean War, where in February, 1855, out of a mean strength of 30,910 for the month, 13,608 men were lying in hospital, and where, during a period of only seven months, from October, 1854, to April, 1855, out of an average strength of 28,939 there perished in hospitals or hospital ships 10,053 men from sickness alone. If we compare these figures with those from South Africa, I think it will be seen that the A.M.D. carried out its

arduous work in such a skilful manner, that the rates of mortality were thereby lessened. The South African troops were in the field for two and a half years. From first to last we sent out nearly 400,000 men; and for a long period an average of nearly 250,000 men were under arms. The total deaths from sickness, up to 31st May, this year, were in round numbers 13,750, and the number invalided during the war were 66,500.

(Q. 10,487.) I think we had evidence that the Civil Surgeons did their work admirably, but that it was of great consequence for the military hospitals to have a proportion of A.M.S. men? Yes, I know that is always found to be necessary, and it is so for many reasons, such as returns, discipline generally, and carrying on the work in an Army manner. . . . There is a proposal to increase it (the A.M.S.) still further to enable it to cope with the needs of a great war. . . . The greatest pressure was at Bloemfontein in April, May and June; May, I think, was the worst; mainly due to the enteric epidemic. . . . I got to Bloemfontein on the 13th March, and during the first week there were no deaths from enteric; it began on the 2nd and it increased gradually, very nearly in regular proportion, until about the middle or end of May. The total number of admissions from the 13th March to the 13th June, 1900, for all cases was 16,167, and of those 4,667 were enteric cases, *i.e.*, one-fourth, roughly speaking. The deaths from all causes were 1,050, and of those 891 were enteric, all but 159 were from enteric within that time. When we arrived at Bloemfontein we were without tents, and every endeavour was made to find buildings to put the sick men into. There was no great difficulty the first week, because no great number were sick, but when they came pouring in afterwards there was tremendous difficulty, not only in finding accommodation, but in finding sufficient beds, hospital clothing, and everything necessary for hospitals. We took every available space, and the people themselves helped us very much indeed; the nuns gave up all their space available for hospitals.

We took the Raadzal, the great public meeting-place, and filled it up also. As far as I could judge, everything was done that could be done, but the railway was not open, and we had to wait, and get things up by degrees.

(Q. 10,494.) That was your real difficulty in bringing up equipment, at any rate? Yes. Everything had been collected by railway from Cape Town as far as Naauwpoort, the junction of the two lines from Port Elizabeth and Cape Town; and when the railway was opened there was the greatest difficulty in arranging how the things should be forwarded on; some articles, not perhaps so urgently required as others, had to be brought away first because they had to be got rid of before the others could be got hold of, but as far as could be managed hospital comforts were brought up without delay. . . . We had short supplies of everything; of ammunition, clothing, and tents; we had to get them up by degrees. The delay at Bloemfontein was due to a great extent to the

short supply of provisions, but I think the main thing which delayed me was the remounts—provisions and remounts.

(Q. 10,498.) I think the witnesses agreed that, as regards the demands for actual hospital necessities, they were met throughout? Yes, I never heard of any complaints as regards medicines or necessary things in hospital.

(Q. 10,500.) You think the whole service worked satisfactorily? Yes, I do. I gave that as my evidence before the Royal Commission which came out to Pretoria.

(Q. 10,537.) Then you said something about the difficulty of expanding the R.A.M.C. in time of war. Do you think that difficulty could have been foreseen? I do not think they were ever intended to have such a large Army in the field; that is the real foundation of it.

(Q. 13,167.) You mentioned to-day a deficiency in the medical arrangements at Kroonstad? Was that a deficiency which you think ought to have been seen and provided for? Yes. I telegraphed to the Principal Medical Officer that I thought he ought to have anticipated our requirements and sent up medical officers quicker than he did. We were very hard pressed at Kroonstad to look after the number of men seized with enteric fever. We had great difficulty about beds and mattresses, and had to ransack every little place in the little town for them; and we filled the church, the hotels and all the available houses with the sick. That made me send the two telegrams to General Wilson that I quoted in my narrative. That was an event that arose out of the war, and not a defect of the service organisation. It came on unexpectedly and very severely.

(Q. 13,171.) You also mentioned that you desired the appointment of a special officer, practically a sanitary officer, at Bloemfontein? Yes.

(Q. 13,172.) The question has been raised in other evidence, I think, whether that ought not to be the general rule? I think it is necessary.

(Q. 13,173.) That there should be a sanitary officer? Yes. I am not sure whether I mentioned it in the first part of my narrative, that I found hospital tents pitched on what was one of the chief sources of the water supply at Bloemfontein; any experienced sanitary officer would at once have seen that that was a wrong thing to do.

(Q. 13,174.) And you would attach a separate sanitary officer to what—every Division? That would depend on the size of the force; but there ought to be a certain number of sanitary officers, and one principal man, who would undertake the work of a Division.

(Q. 13,255.) Some remarks were made about the Medical Service, and one witness said he thought the A.M.D. suffered and was greatly hampered by its over-organisation, and as the organisation got knocked on the head in service a good deal it got better; did you observe that at all? I did not notice it. I confess, as far as I saw the A.M.D. they did very well. They were overtaken by the extraordinary number of men who got sick in a few

days, both at Bloemfontein and Kroonstad, but those I had with me worked splendidly.

(Q. 13,256.) It was stated that there was a good deal too much clerical work, and that officers who should have been employed in medical or surgical work had a great deal of their time taken up by administrative work? It was not brought to my notice, and when I went to the hospital I never saw it. I think on the whole they did their work very well.

(Q. 13,259.) There was evidence given that the medicines were rather behind date, and that the instruments were of rather an antiquated description, and so forth? I never took any of the medicines, and did not want any of the instruments, so that I do not know myself, but I never heard of any complaint of them.

Professor Alexander Ogston, C.M., said he was a Professor at Aberdeen University, and went out to South Africa in December, 1899. He was well acquainted with the foreign systems of military surgery. His observations led him to conclude that England was prepared only for wars of very limited extent, and had not an Army Medical Service organised to any such degree as would be required for a European war, or such a war as this in South Africa proved to be. The provision of officers and men was quite inadequate. They had provision for about 40,000 of an army, whereas a couple of hundred thousand had to be provided for. His opinion was formed from what he saw himself, between January and July, 1900. He visited Gatacre's Column before Stormberg; French's Column at Rensburg, and served with the Modder River Column, accompanying Lord Methuen's Column from Kimberley to Boshof, Hoopstad, Bothaville, and Kroonstad. He was with it immediately after Magersfontein. At his first visit the wounded had been evacuated to Orange River, De Aar, and Wynberg. When the wounded came back to Modder River from Paardeberg the provision of officers and men of the R.A.M.C. was very deficient; and they had exceeding difficulty in dealing with the sick and wounded, both in the convoys and in the hospitals at Modder River. There were 800 men there on one occasion; they had to be accommodated in two Field Hospitals which had only equipment for one hundred men each. . . . The circumstances of South Africa were peculiar; and it was not possible to deal rigidly with base hospitals and field hospitals according to their theoretical organisation. The field hospitals had to act as base hospitals, but to evacuate their wounded as rapidly as possible to the real base, Cape Town, or the supplementary bases at De Aar and Orange River, and some sent to Naauwpoort.

The field hospital accommodation at Modder River was insufficient. There were seven or more men in tents intended for only four. . . . At the Modder River our surgeons, besides attending to their field hospital duties, had to attend to the convoys down country, so that on some occasions there were in one of the field hospitals only two, or perhaps three, surgeons to attend to all that number that flowed into it. . . .

There were three medical attendants to attend 400 sick and wounded on the 24th February. There were typhoid cases and very badly wounded cases, and we ought to have had four times that number to do anything like justice to them. Two of them were army surgeons, the third was a civilian. There were by no means enough hospital orderlies, but I can give no data regarding them, they were such a fluctuating body. They were attending the typhoid cases and really they were ill themselves, and dying daily with typhoid fever, so they were scarcely constant for one day. . . . I can remember one convoy that came in from Paardeberg of several hundred sick and wounded, and they had only one medical officer with them. . . . The N.C.O.'s and men cannot be accused of any lack of zeal and devotion. The way in which they sacrificed themselves to do what they could was beyond all words of praise; but many of them were not at all the kind of men who ought to be N.C.O.'s and men of the R.A.M.C. Many of them came into it untrained from regiments, and if they received any training it was merely a little in first aid and carrying wounded in the field. Most of them were absolutely ignorant of anything like what was required for attending on the sick . . . and hence, in spite of their good-will, they failed from want of this training. Some of them were exceedingly good, but they were few. Most of them seemed to have joined with the idea that their duty would be to go into the field behind an advancing regiment to pick up the wounded, stop their bleeding, and carry them to the tents; and when they found that their duties were nothing so brilliant as that, but consisted in the tedious watching day and night over men who were sick, delirious and dying, and when their comrades were taken in daily and dying around them, they often lost heart. It required, in fact, a quiet heroism that very few of them possessed to enable them to carry out their duties, especially in attending on the sick and the fever cases, which were very numerous. They knew nothing about disinfectants, not even which were good and which were bad. They had no training in keeping themselves disinfected; many of them looked upon it as a species of cowardice if they attended to such things as avoiding infection—a sort of shirking of duty. The hands were not disinfected, nor the utensils, nor the wards. In one hospital accommodating fifty-three cases of typhoid, the only source of disinfection for the orderlies was a basin containing creoline and water, placed in the verandah—and this they used or not, as they thought proper. . . . The sick and typhoid cases were sent down to the base, many of them still suffering from diarrhœa, without any washing or disinfection of their bodies or clothes; often in ordinary trains—so the disease was widely spread. These orderlies cooked and so increased the infection, some of them from lack of knowledge washed the kettles in filthy puddles, and scraped them with the infected earth around; and although careful instructions were issued to them, and posted in all the buildings, there was no staff to compel attention to them; and as they had not been trained,

civil population as well as for the military. They have eye, ear, fever cases—even gynæcological cases, and in them the officers are, therefore, real professional men. They are men who are proud of being medical men, and they esteem it a higher distinction to be an accomplished medical man than to hold any officer's rank. They are interested in their profession, and are trained in the most recent knowledge regarding it. They are equal to civil medical men in every capacity, and are capable of importing into war all the attention that a sick or injured man claims in times of peace; I think a country like ours is bound to give in a campaign, as far as is practicable, the same skill and attention as a sick or injured man now receives in time of peace.

(Q. 11,013.) Do I understand you to mean that from want of experience the Army Medical Service officers are not equal to the civilian surgeon? That is precisely what I think. They are not equal simply from want of practice. They are as a class superior to the civilian doctor, of a higher standard, selected by examination, but the moment they enter the Army they are cut off from all practice of their profession.

Things advance rapidly, improvements are continually introduced, and the man who does not find his daily work amongst them cannot be equal to the civilian.

In Russia they gain their experience; they know what is being done. They demand, and are provided with, all the most modern equipment on a scale that does not exist in our Army, and are familiar with everything of that sort. Bacteriology does not exist in our Army save, I suppose, in the case of that eminent man, Professor Wright, of Netley, and a few others. There was no possibility of obtaining bacteriological investigations anywhere in South Africa save by applying to the civilians there; and I am not aware that this was ever done. It was not even possible in a case of doubtful typhoid fever to apply the well-known Widal's test, and to provide either for his evacuation to the base before the dangerous stage set in or to treat him where he was.

There were no microscopes, no special instruments. . . . In Germany every medical man in the Army, however remotely posted, can at set intervals apply to be admitted for a time to the practice of civil hospitals. They are attached as house surgeons, attend all the instruction in them, have wards if they are sufficiently high in rank, and show ability, become teachers of the civilians, and are on a par with them in all respects. The same thing obtains in Russia, and then they can be appointed to provincial civil hospitals, where they still carry on their profession, keep up their knowledge, and yet be available in time of war. . . . I think it possible to give our Army surgeons opportunities of practice in our hospitals. This is a mere question of expense. A great deal more might be done in the military hospitals by teaching those connected with the Army, the children and women in them, and even by admitting civilians. They should be allowed study—leave, to become house

surgeons, residents and assistants in civil hospitals; and to keep up their training equally with that of any civilian. . . . If Army Medical officers were admitted to the civil hospitals there would be a little difficulty with the civil surgeons; such a difficulty exists in Germany, but it is overcome. There are a number of our provincial hospitals where very admirable medicine and surgery is carried out, where I think they would welcome our junior Army Medical officers who might be permitted for a year or so to serve in them as house surgeons.

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Reviews.

WOUNDS IN WAR, THE MECHANISM OF THEIR PRODUCTION AND THEIR TREATMENT. By Surg.-Gen. W. F. Stevenson, C.B., A.M.S.
Published by Longmans, Green and Co. Price 15s. net.

Since the publication of the first edition in 1897, the Spanish-American and South African Wars have afforded experiences of wounds produced by modern firearms and their treatment by the most recent surgical methods. The increased knowledge thus obtained has been incorporated in the present volume. The author has followed the general arrangement of the first edition.

Chapter I. contains a brief account of the evolution of the modern rifle from the hand-gun of the fifteenth century, a description of the mechanism of projectiles, and a comparison of the various characteristics of the rifles and ammunition used by the armies of the countries of Europe and that of the United States of America.

In Chapter II. a description is given of the injuries produced by projectiles on the various tissues of the body; wounds caused by the old are compared with those produced by the modern rifle-bullet, moving at a high velocity; the results of injuries inflicted by this at different ranges are considered, including the various theories of the cause of the so-called "explosive effect." Shell-wounds, wind-contusions, the alleged poisonous and burning effects of bullets, are discussed.

Chapters III., IV., and V., treat of the primary phenomena and symptoms accompanying gunshot wounds and of their general treatment. It is pointed out that the modern small-bore bullet is more likely to injure blood-vessels than the old slow-travelling, blunt-pointed bullet, which often pushed them aside in its course instead of wounding them.

In Chapter V. the author, if we understand him rightly, advocates the exploration of all gunshot fractures, septic or aseptic, on the ground that the amount of damage cannot be ascertained, and that when a bone is hit some splinters almost always require removal. We hardly think that the majority of surgeons would endorse this view, but that they would be inclined to limit exploration to septic fractures, and possibly to those in which bone comminution was extreme although aseptic. This chapter requires, and is no doubt intended, to be read in conjunction with that on the use of the X-ray in hospitals in war.

Chapters VI. to XII. are devoted to regional surgery. Gunshot wounds of joints, it is pointed out, formerly a most severe form of injury, have completely changed their character under modern conditions of warfare. An aseptic joint wound is now a comparatively trivial affair.

We notice that exploration of wounds and removal of fragments is advised in joint injuries when comminution of bone has occurred, at any rate when it is severe; and whether the case is septic or aseptic, excisions of any sort are now rarely, if ever, necessary, and primary amputations are only required in consequence of severe injuries to the soft parts, vessels, nerves, &c. The available results of conservative surgery in gunshot wounds of the hip are given from the Spanish-

American and Boer Wars, and show a mortality of 27·2 per cent., as compared with 80 to 90 per cent. in former campaigns. In fractures of the diaphyses of long bones excision in the continuity is condemned; conservative treatment is the general rule to be observed in all these cases, and tables are given showing the favourable results that may be expected from it. In gunshot fractures of the skull the necessity of early operation is emphasised, and if the injury is a perforating one, both apertures should be so treated, if possible.

Cases collected so far from the South African War are quoted, and the results show a reduction of mortality as compared with the American Civil War of 27 per cent.

Operation in wounds of the spine is, in the author's opinion, hardly ever justifiable, even less so now than formerly, as the modern bullet moving at high velocity can, as has been proved by experience in South Africa, cause such injury to the cord by concussion, apart from actual lesion, as to completely interfere with its conducting power. Uncomplicated penetrating wounds of the chest at the present time are shown not to be severe injuries and soon heal, with rapid convalescence, even when accompanied by moderate hæmothorax. This is contrasted with the conditions observed in wars prior to the Spanish-American, in which the mortality from these injuries averaged 65 per cent. The various complications of chest wounds are described. The possibility of recovery after actual wound of the heart is considered to be very remote, and no case in which it could have been said with certainty to have occurred has been reported from South Africa.

In the chapter on penetrating wounds of the abdomen the difficulties of operative treatment are discussed and compared with civil practice. The conclusions arrived at are, that while theoretically the correct procedure, operative measures in the field must under the circumstances be confined to cases in which death is threatened from internal hæmorrhage, or when viscera protrude through the wound.

Then follow chapters on traumatic aneurysms, injuries of peripheral nerves, the use of X-rays in military surgery, with a paper by Mr. Mackenzie Davidson, in which his methods of localising bullets, &c., are very clearly described. The last thirty pages are occupied by some remarks on the effects of the use of small-arms in modern warfare as compared with those of earlier wars, and a short account of the work of bearer companies and hospitals in the field with special reference to surgery. Finally, a description of the objects and rules of the Geneva Convention is given.

The book is very little larger than the first edition, it is well got up, and forty additional illustrations, including a good series of skiagraphs of bone injuries from the South African War, have been inserted. It appears to us to be the most complete available exposition of the military surgery of the present day.

G. H. SYLVESTER.

HANDBOOK OF INSTRUCTIONS FOR COLLECTORS. Issued by the British Museum (Natural History). With Illustrations. Sold by Longmans and Co., and at the British Museum (Natural History), Cromwell Road, S.W. 1904.

In the preface Professor Ray Lankester, the Director, states, "In past years the Museum collections have been greatly augmented and enriched by the donation of valuable series of specimens obtained by travellers and others whose vocations have necessitated their residence abroad in all parts of the world.

"It often happens that military and naval officers, explorers, missionaries, and others have leisure time which they would be willing to devote to collecting natural history objects if they had a better knowledge of the manner in which such things should be collected and preserved.

"In order to meet this requirement it has been thought advisable to prepare a series of pamphlets treating upon the collecting and preservation of specimens in all branches of natural history. These can be obtained separately, but for the convenience and use of those who are willing to take up more than one branch of collecting, they are now united and issued in book form, thus forming an introductory manual of instructions on the subject generally.

"Although primarily written for the use of voluntary collectors, this work will prove equally useful to those professionally engaged in collecting, as showing the approved manner in which the various objects referred to should be treated.

"The various chapters have been written by different members of the staff of the Natural History Museum with the hope that the distribution of this work will lead to the formation of the important collections which will ultimately come to us for study and comparison, and possibly enrich the series preserved in the Museum."

D. BRUCE.

A COMPARISON OF THE REACTIONS OF THE TRYPANOSOMES OF UGANDA AND CONGO FREE STATE SLEEPING SICKNESS WITH THOSE OF *TRYPANOSOMA GAMBIENSE* (DUTTON). A Preliminary Report. By H. Wolferstan Thomas, M.D., C.M.McGill (J. H. Todd Memorial Fellow in Tropical Medicine), and Stanley F. Linton, M.B., B.Sc.Vict. (Assistant Demonstrator). From the Johnston Tropical Laboratory, Liverpool University,

The strains we have used in our work are as follows: Three strains of *Trypanosoma gambiense* from Gambia. Two strains from Uganda: (a) from the cerebro-spinal fluid of a sleeping sickness case; (b) from the blood of a trypanosome fever case. Four strains from the Congo Free State: (a) from the cerebro-spinal fluid of a case of sleeping sickness; (b) from the blood of a case of trypanosome fever; (c) and (d) from the blood of two natives at present under observation in Liverpool.

Conclusions.—(1) The trypanosomes found in (a) cerebro-spinal fluid of Uganda sleeping sickness cases, (b) cerebro-spinal fluid of Congo Free State sleeping sickness cases, (c) blood of Uganda trypanosome fever cases, and (d) blood of Congo Free State trypanosome fever cases, are all identical in animal reactions and morphology with *T. gambiense*. The

specific name *gambiense* (Dutton) must therefore for the future include the trypanosomes from the above-mentioned sources.

(2) There seems to be no acquired immunity against infection.

(3) There is no transmission of immunity to offspring.

(4) An animal which seems to have recovered many months later show parasites once more, apparently as the result of lowered vitality.

D. BRUCE.

A CLINICAL HANDBOOK OF URINE ANALYSIS. By Major C. H. Bedford, D.Sc., M.D., I.M.S., Professor of Chemistry, Calcutta Medical College. Second edition, pp. 160. Bell and Bradfute, Edinburgh, 1904.

The first edition of this book appears to have been published in India for use in civil and military hospitals. In the present edition, which has been considerably enlarged, the author appears to have justified his claim to "place the essentials of clinical urine analysis before the student and medical practitioner in a brief, simple and convenient form."

The book is divided into two parts, the first of which deals mainly with the physical characters and qualitative analysis of urine; while the second part is devoted to quantitative work. The first fifty pages dealing with the physical character and bacteriological examination of the urine and with urinary deposits are excellent, the descriptions, though brief, being clearly written and eminently practical. The chapter on the physical characters of urine is particularly good. It is unfortunate, however, that the illustrations of urinary deposits (which are placed at the end of the book) are so far removed from the description of these deposits.

The descriptions of the qualitative processes of urinary analysis are also good, the chapter on albumen testing and differentiation of the urinary proteids especially so.

There are several points in the second part of the book—that dealing with quantitative urinary analysis—which may be criticised. On p. 121, when speaking of substances which interfere with estimation of sugar in the urine by the polariscope, no mention is made of β oxybutyric acid, which is by far the most important cause of error, in fact, so important as to render this method of sugar estimation futile when the acid is present. No mention, again, is made of the estimation of β oxybutyric acid by the polariscope, which, considering the importance of the acid as a factor in diabetic coma, is regrettable in any work dealing with clinical urinary analysis.

The quantitative estimation of the urinary sulphates is omitted, as the author considers that "such estimations are practically unheard of for clinical purposes," and as "the processes require to be carried out in a well-equipped laboratory." This seems to be an unfortunate omission, as the ratio between the conjugated and total sulphates is generally conceded to be of considerable clinical interest; while the methods required for their estimation (gravimetric method) are certainly not more difficult than Auteureith's process for oxalates in urine, or the Sutton-Mohr method for chlorides, described by the author. Both these processes are long and tedious, the first inevitably so, as it is the only

good process; the second, perhaps, unnecessarily so, as there are other and simpler processes known of estimating the chlorides with a reasonable degree of accuracy.

There is no description given of any process for the estimation of the total nitrogen or preformed ammonia of the urine, which is to be regretted, as a knowledge of the ratio ammonia nitrogen—total nitrogen—is so important, especially in diabetes. Kjeldahl's process cannot be considered a difficult one to carry out anywhere, while the Schäffer's ammonia apparatus can be improvised if a little trouble is taken.

The author describes what appears to be an excellent clinical method of uric acid estimation in the piperidine process (p. 135). This process is based on the fact that piperidine, which is an organic base and forms alkaline solutions in water, combines with uric acid to form a piperidine urate. If phenolphthalein be added to the uric acid, separated out from urine by means of ammonium chloride and hydrochloric acid, and a hot solution of piperidine poured on to the uric acid, a red colour is formed in the mixture directly all the uric acid has combined with the piperidine and the base is in excess. The combining proportions of piperidine and uric acid being known, the amount of the latter is readily calculated.

The last chapters of Major Bedford's book are devoted to a description of the analysis of urinary calculi, the matter in each case, though brief, being clearly put. The ten plates of illustrations which terminate the book are admirable.

On the whole, this little book is a really useful addition to the literature of clinical urinary work, and may be recommended to any in search of a short, clearly written and practical book on the subject.

J. C. B. STATHAM.



Current Literature.

The Value of Sugar and of Alcoholic Liquors as Articles of Soldiers' Food. — M. Boigey, médecin aide-major, in *Le Caducée*, January 9, 1904, traverses current views on the above subjects. He notices the statements by soldiers and sportsmen to the effect that sugar is a very valuable food, that it aids physical resistance and increases muscular vigour. He endeavoured to ascertain whether these statements could be verified by experience. For this purpose he chose twenty men, each weighing from 76 to 78 kilogrammes, in perfect health, never having been sick, and with excellent powers of digestion. He gave each of these men 40 grammes daily of refined white sugar, half being taken at 9 a.m. and half at 4 p.m. The sugar was either dissolved in water or taken dry, and the first series of experiments was continued for a month. The men were then weighed; eleven had increased 1 kilogramme; three, 2 kilogrammes; while two were 4 kilogrammes heavier; in four there was no change. During the month no alteration had been made in their work or rations. The two who had gained the most in weight stated that during the last week their appetite had almost completely failed, and that muscular strength had begun to diminish on the fifteenth day. A little blood taken from one contained 2.75 per 1,000 of sugar, traces of which existed in the urine. The action of the bowels had become irregular and there was occasional diarrhœa. The three who had gained 2 kilogrammes complained of progressive muscular weakness. In one the urine contained a trace of sugar. The others testified to a feeling of satiety, previously unknown. Increase of muscular strength was denied by all.

After a month's interval, the experiment was renewed under similar conditions. At the end of the time sixteen men complained of muscular weakness; two others of dryness of the mouth and continual thirst; in these the urine contained 3 grammes of sugar per litre. Diarrhœa, colic, loss of appetite and indigestion were commonly mentioned, but never increase of strength.

Boigey attributes the increase in weight to accumulation of the sugar in the interstitial plasma, the system being unable to deal with the quantity ingested. The sensation of fatigue is caused by lactic acid, a product of the decomposition of the sugar, and one which is known to weaken the force of muscular tissue. Instead of increasing muscular vigour, the administration of sugar would appear to have an opposite effect, and also to cause dyspepsia and other ailments.

With regard to the question whether alcohol is useful or mischievous, Boigey states that he has made experiments on more than 300 soldiers, and has reason to believe that alcohol as taken in beer, cider and wine, and in strictly moderate quantities, is a very useful addition to soldiers' rations, causing the men to enjoy their food more than they otherwise would. He objects to the inference that alcohol is always mischievous because of its effects when taken in large quantities.

T. P. SMITH.

The Value of Sugar and Alcoholic Liquors in Soldiers' Rations. — Dr. Bienfait, of Liège, criticises (*Le Caducée*, February 6, 1904) Dr.

Boigey's conclusions on this subject. He agrees with the opinion that ardent spirit should be excluded, but asserts that Boigey has not proved to his satisfaction (1) that wine can take the place of other foods; (2) that sugar is either useless or injurious. It may be quite true that among the twenty soldiers, each of whom took 40 grammes of sugar daily for a month, there was no increase of muscular power, but more or less frequent dyspepsia. Such a result was only to be expected. The men were well fed; their usual ration sufficed for all their wants, and the daily dose of sugar was more than the liver could deal with. There was no reason why muscular power should be increased; moreover, no precise test (*e.g.*, the dynamometer or the ergograph) was made use of. Sugar is really beneficial when food is deficient and great exertion is required. It would therefore prove useful during a campaign, and possibly during manœuvres. Such, indeed, has been Bienfait's experience.

With regard to the utility of wine, Boigey has been guided by the statements of those to whom it was given. The *really useful* effect must be distinguished from the qualification afforded, and from the *impression* of increased vigour created by the stimulant. It has been clearly shown that small doses of alcohol lessen intellectual and muscular power, while producing a feeling of satisfaction. This it is which leads to the belief in the accomplishment of more work than has actually been performed.

T. P. SMITH.

The Parasitic Acarina of Anopheles.—The frequent presence of maggots on the *Culicides* has been noted by Laveran, Macdonald and Gros. MM. Edmond and Etienne Sergent (*Comptes Rendus des Séances de la Soc. de Biologie*, Tome lvi., p. 100) state that in Algeria the maggots of certain Acarina are frequently found as ectoparasites of Anopheles, but never on *Culicides* or other mosquitoes. They are the hexapod larvæ of some form of Hydrachnidæ, possibly the *Eylais*, *Hydrodroma*, *Hydryphantes*, or *Diplodontus*. These maggots infest the Anopheles between May and October in all the stages of development. Thus they were found on nine larvæ, two pupæ, and twelve female and five male adult *Anopheles maculipennis*. The presence of these parasites does not appear to interfere with the development of the Anopheles larvæ. When the larva enters on the pupa stage the maggots transfer themselves to the latter, and later from the empty case to the imago. There may be as many as ten parasites on one insect. They live on the abdomen of the larva and adult insect, but on the pupa they are found on the dorsal surface, close to the point of rupture of the pupal membrane. They are attached to their hosts by their suctorial cone, and increase in size, but appear not to produce appreciable damage.

C. P. HANDSON.

The Treatment of Sweating Feet by Formaldehyde Ointment.—The Prussian War Office, Medical Branch, has recommended the following prescription (*D. Militärärztliche, Zeitschrift*, for March, 1904):—

Powdered medical soap	...	...	50	parts.
Solution of formaldehyde (35 p. c.)	...	...	300	"
Hard paraffin	...	...	20	"
Anhydrous lanoline	...	...	100	"
Salicylated mutton suet (2 p. c.)	...	...	525	"
Thymol, or oil of wintergreen	...	...	5	"

The soap and the solution of formaldehyde are placed in a strong glass flask, having a large mouth, and well shaken; the flask is closed and gently warmed, until a glutinous mass is formed. The paraffin, lanoline and salicylated suet are then melted and poured into the flask, which must be again well shaken. After the mixture has become cool, add the thymol dissolved in a little spirit, or the oil of wintergreen. The ointment is to be kept in metallic capsules covered with varnish.

The ointment has been found to act satisfactorily. Further trials are directed to be made and the results reported. The stability of the preparation, its cost as compared with salicylated suet, and any advantages or the opposite, are to be especially noted.

C. P. HANDSON.

The Hæmatozoa of Birds in Algeria.—MM. Edmond and Étienne Sergent (*Comptes Rendus des Séances de la Société de Biologie*, Tome lvi., p. 132) have examined the blood of 307 birds belonging to eighteen species in Algeria. Of these only eighteen birds were free from hæmatozoa. Thirty-seven harboured the *Hæmamœba relictæ*. Except in two birds this hæmatozoon was never numerous. The *Hæmamœba Danilewskyi*, which was present in 155 birds, was found in greater numbers in the blood. In five birds both hæmamœbæ were present together. In two birds numbers of the *Hæmamœba Ziemanni* were found. Trypanosomes were present in the blood of six birds, very few examples were seen, and in dried specimens none were visible. Embryos of filariæ were present in forty-two birds. They were of four kinds: one was present in the sparrow, goldfinch, black-headed warbler and linnet, which had no sheath; another also without a sheath in the crested lark; a third with a sheath in the goldfinch; and a fourth in the owl (*Surnia noctua*). The adult filariæ in the sparrow were present in pairs in the cellular tissue of the adductor muscles of the thigh and abdominal muscles.

C. P. HANDSON.

The Red Cross Society of Japan.—By Col. Nicholas Senn, U.S. Army (*Journal of the Association of Military Surgeons*, April, 1904). The Red Cross Society of Japan is based upon an organisation formed during the insurrection in the south-west provinces in 1877, with the object of caring for the sick and wounded in the hostilities connected therewith. As indicative of its character the organisation adopted the name of "Hakuaisha," or Society of Benevolence. At the close of the campaign the society effected a permanent organisation with a view to similar action in other like emergencies.

With the adhesion of the Japanese Government to the Geneva Convention this Society was transformed into the Red Cross Society of Japan, and became a member of the fraternity of Red Cross Societies throughout the world. The growth of the organisation has been phenomenal. Its membership now numbers 800,000, which, estimating the population of the country at 45,000,000, would give it a representative in nearly every family in the Empire. The reasons for this very remarkable prevalence may be found in the strong official influence at the back of it. The Imperial family is deeply interested in and contributes largely to it. An Imperial Prince is its honorary president, and a Princess the president of the ladies' committee. The Empress is a frequent visitor to the headquarters

of the Society and to the Red Cross Hospital. Moreover, the medical profession is held in the highest estimation by the Imperial family.

Baron Ishiguro and Baron Hashimoto, the leaders of the medical profession in Japan, have been the guiding spirits in promoting the growth and development of the Society, and at the back of them has been the strong support of a united profession. The Japanese have responded promptly and liberally to these influences.

Much credit must be given also to the fact that the Japanese people are fully imbued with the spirit of progress, and that they are well aware that they have entered upon a stage in international life that may bring at any time serious emergencies which they should be ready to meet; and so they have been quick in making ample preparations for hostilities before the horizon of peace should be darkened by the clouds of war, and among these the work of the Red Cross Society has been a most important factor. Popular interest in the subject has been maintained by great public assemblies of the Society, to which members gather from every part of the Island Empire once a year, when lectures are delivered by medical men with stereopticon illustrations showing the actual work of the Society. These meetings are usually held in Ueno Park, Tokio, and the attendance is seldom less than 200,000. Baron Ishiguro informed me that the lantern illustrations attracted a great deal of attention, and were probably the most important factor in popularising the organisation and as a means of a practical instruction in first aid work.

The headquarters of the Society are in Tokio and consist of a number of buildings occupied as central office and store-rooms. Through the courtesy of Barons Ishiguro and Hashimoto I was privileged to inspect every department, as well as the military school and hospitals.

The central office is a capacious, well lighted, and luxuriously furnished room. Adjoining this is an apartment set aside for the Imperial family, to which elegant furniture and oil portraits of the Emperor and Empress impart a thoroughly royal aspect.

It was the contents of the store-rooms, however, that astonished me with their vivid evidence that Japan was well prepared for war. The amount of hospital supplies was something enormous. Stacks of uniforms and black dresses and white caps for female nurses, lanterns, canteens, blankets, bedding, cots, medicines, tents, waggon-loads of dressing materials, field chests, litters and trains of ambulances filled the many capacious rooms to their ceilings. Within a day or two the Japanese Red Cross Society can load a hospital ship or railroad train and leave for the seat of war without causing the least anxiety or confusion. Medical officers and nurses are ready at all times to respond to the call, and the arrangements of the hospital stores are so systematic that they can be assembled and transported in the briefest possible period. The Red Cross medical officers and male and female nurses are under military discipline, and do their work in the hospitals behind the fighting line.

The Society owns and operates two hospital ships, the "Hakuai-Mar" and the "Kosai-Mar" (which are fully described in the translation by Lieut. Barney in this number of the *Journal of the Military Surgeons*).

The Red Cross Hospital in Tokio stands the highest of the many fine hospitals in that city. Here the Red Cross female nurses receive their education and training. It has a capacity of 250 beds, and its attending staff is selected from the leading members of the profession in the city.

The central figure of the staff is Baron Hashimoto, a retired Surgeon-General of the army. The instruction of the nurses by the members of the attending staff is of the most practical kind. They are made nurses not half doctors, as is the case with many other training schools. They serve an apprenticeship of three years, and on passing a satisfactory rigorous examination, receive a certificate which entitles them to engage in private nursing and, in the event of war, to employment in military service. They compare well with the trained nurses of America, and, it seems to me, are in many ways better adapted for service in the field, as their needs are few, and their quiet, gentle behaviour cannot fail to secure for them the respect and confidence of the disabled soldier.

It may be seen, then, that the Red Cross Society of Japan is entirely capable of meeting the present emergencies of the existing hostilities, and that there is no demand as yet for additional help.

A Modern View as to Immunity.—While few would maintain that Ehrlich's theory of immunity is a final explanation of this difficult problem, still the majority of scientific thinkers regard it favourably as a working hypothesis. A recent and interesting article by Grüter and von Pirquet (*Münch. Med. Wochens.*, July 14 and 21, 1903) suggests, however, that it is based upon somewhat faulty conclusions. They argue that there is no satisfactory proof that a multiplicity of poisons exists with each disease, of qualitatively similar action, but varying toxicity and affinity toward the antitoxin, such as Ehrlich has assumed in the enunciation of his "poison spectrum" theory. They likewise take exception to the view that there is reason to assume that toxins act differently from other organic poisons. They submit that the conversion of a toxin into a non-poisonous toxoid with undiminished affinity for the antitoxin is certainly possible, but not strictly proven. Toxin and antitoxin have weak chemical affinities towards each other and, in combining, they follow the law of other chemical compounds of weak attraction. It is possible that occasionally molecular compounds of varying proportions are also formed, and the author suggests that the period of incubation and other phenomena of infective diseases are best explained on this hypothesis.

They further maintain that the formation of antitoxin has nothing to do with toxicity and cell immunity; their essential arguments are that (a) many harmless substances can lead to the production of antitoxin; (b) animals, non-susceptible to certain toxins, are capable of manufacturing antitoxins; (c) notwithstanding the presence of a large amount of antitoxin, the susceptibility to a poison may still persist and even increase; (d) cell immunity can be acquired without the formation of antitoxin; (e) the antibodies are not found in those organs where the toxin is most active. Their further arguments are to the effect that specific antibodies are not normal constituents of the body, but that their production occurs only after the introduction of foreign material and has the character of an internal secretion, being due to unknown peculiarities in the molecular structure of the foreign matter. Finally, the non-poisonous toxin-antitoxin compound does not lead to the formation of more antitoxin, it is chemically of an entirely different structure than its two constituents.

The paper referred to is certainly very plausible in many of its arguments, but we question whether it can be deemed to be an absolutely

successful refutation of Ehrlich's theory. It is, however, worthy of consideration, as being a well-thought-out attempt to consider the question from another point of view. In many of their views the authors are in accord with those of Arrhenius and Madsen, as put forward in their philosophical application of physical chemistry to the study of toxins and antitoxins in *Zeitsch.-f. physik. Chemie.*, t. xlv., 1903, p. 6.

R. H. FIRTH.

The Identification of the *Bacillus Diphtheriæ*.—The notorious difficulty experienced by those called upon to pronounce as to specimens obtained from the throats or noses of persons suspected to be suffering from diphtheria renders the differential value of the various characters by which the organism of the disease may be recognised of the first importance. Since Löffler first isolated the *B. diphtheriæ* in 1884, it has been recognised as the essential factor of diphtheria, but experience has shown that its identification is not such a simple matter as it at first promised to be. This arises from the fact that there occur constantly in the throat and elsewhere certain micro-organisms simulating *B. diphtheriæ* in one or more respects, but devoid of the same pathogenic significance. With a view to simplify the situation, Dr. Gordon submits an interesting summary of his work in the *Supp. to 31st Ann. Rep. Local Gov. Board*, 1903, p. 418. As a result of his researches he emphasises the fact that the main characters by which *B. diphtheriæ* is identified are four in number. First, the macroscopic and microscopic appearance of the growth on serum. Secondly, the behaviour of the suspected organism to stains such as Löffler's methylene blue, Gram, and especially Neisser's stain for granules. Thirdly, the reaction shown to litmus by a subculture in neutral or slightly alkaline broth, containing 2 per cent. dextrose, after forty-eight hours at 37° C. Fourthly, the test of pathogenicity on subcutaneous injection into a guinea-pig. In practice, however, it is not always possible to apply all these tests before giving an opinion, especially if a verdict is required within twenty-four hours. Under these circumstances, it is from the microscopical appearance of the growth on serum, and from its staining reactions, that the conclusion is arrived at commonly that in a given material "a micro-organism is present, morphologically indistinguishable from *B. diphtheriæ*."

A study of the literature shows that while there is practical unanimity with regard to the character of typical *B. diphtheriæ*, there is some difference of opinion as to the nature of certain bacilli with which it is liable to be confused. These diphtheroid micro-organisms practically resolve themselves into three groups. Group 1 consists of those which fulfil all the requirements of genuine *B. diphtheriæ*, including morphology, staining, acid production and pathogenicity. The other two groups are not pathogenic to guinea-pigs. Group 2 consists of organisms resembling *B. diphtheriæ* in morphology, staining, and in acid-production, but differing from that organism only in the fact that they are not pathogenic to guinea-pigs. Organisms of this type are generally considered to be attenuated examples of the Klebs-Löffler bacillus. Group 3 is composed of Hoffmann's bacillus, which differs from *B. diphtheriæ* not only in being non-pathogenic for guinea-pigs, but also in morphology, staining, and in producing not acid but alkali in dextrose broth. A further group has been described, consisting of the so-called *B. xerosis*. This organism occurs in the

conjunctival sac both in health and disease, and resembles *B. diphtheriæ* in microscopical morphology more closely in some respects than does Hoffmann's bacillus, but differs macroscopically, does not stain with Neisser, does not produce acid in dextrose broth, and is quite devoid of pathogenicity for guinea-pigs.

The chief value of Gordon's work lies in the fact that he has subjected a considerable number of micro-organisms resembling *B. diphtheriæ*, but not possessing all its four main characters, to a detailed examination. With regard to the liability of mistaking them for *B. diphtheriæ* in actual practice, Gordon believes that with care and experience the danger is not great, provided their existence is realised. It is when the subject is viewed too narrowly that mistakes are likely to be made. He finds that forms of *B. diphtheriæ* that are non-pathogenic to guinea-pigs are comparatively rare. "If a serum culture is used in the first place, and if after incubation for eighteen hours or thereabouts at 37° C. a diphtheria-like organism is present that distributes over the cover-glass film in clusters characteristic of *B. diphtheriæ*, that stains with Löffler's methylene blue in the manner of *B. diphtheriæ*, and that, thirdly, shows bipolar granules with Neisser's stain, my present investigations lead me to infer that such an organism is in the overwhelming majority of cases the Klebs-Löffler bacillus." Without Neisser's stain the danger of confusion is greatly increased. Some forms of Hoffmann's bacillus are sufficiently like some of the cluster forms of the genuine diphtheritic organism to cause doubt when stained with Löffler's blue, therefore Neisser's stain is of real value in excluding Hoffmann's bacillus, and of equal value in excluding *B. coryzæ segmentosus* (Cautley), an organism that from its irregular staining, its length, and its beaded appearance when growing on serum, may easily be confused with *B. diphtheriæ*, especially when a nasal discharge is under examination. Other diphtheroid organisms that show granules with Neisser would be suspected or excluded by their greater breadth in proportion to their length, by their more uniform size, or by their coherency.

Gordon has made some observations also on the value of the serum agglutination test in diphtheria. Hitherto, this has been complicated by the difficulty of getting an emulsion showing the bacilli sufficiently separated. This he overcomes by the following technique: A little of the growth from an agar slope of two days' culture is transferred to a gelatine slope, and thoroughly distributed over the gelatine surface. A few drops of sterile normal saline solution are poured on the gelatine and the growth suspended in the fluid by allowing the latter to run over the surface, and the same time raking with a platinum needle. Some of the emulsion is now drawn up into a capillary pipette and a drop examined microscopically as to freedom for clumps. Gordon's results with sera, so far obtained, seem to imply that, as a means of identifying *B. diphtheriæ*, this agglutination test promises to be of more value in its positive than in its negative aspect; but it is probably too early to formulate conclusions.

R. H. FIRTH.



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ON THE COLLECTION AND PRESERVATION OF
PHLEBOTOMIC DIPTERA.

BY MAJOR N. MANDERS.

Royal Army Medical Corps.

SOME six or seven years ago, when attention was being directed to the *Culicidæ* through the observations of Ross and others in malarial fever, the British Museum authorities solicited assistance from all parts of the world for the collection of these insects for the purpose of studying and classifying this neglected family. The outcome of this appeal was Theobald's "*Monograph of the Culicidæ*."

Among others, the principal civil medical officers of the various colonies were asked to obtain assistance from the officers serving under them in the collection of mosquitoes (I am not aware that P.M.O.'s, R.A.M.C., were likewise asked), and some time afterwards I had forwarded to me the results of this world-wide appeal and collection.

The analysis showed, as might have been expected, a most curious assortment of insects, the majority, I think I am right in saying, were in too fragmentary a condition for discrimination, some were, strictly speaking, not insects at all, and a great many belonged to other groups than *Culicidæ*. It is quite possible that the British Museum will solicit the help of medical officers abroad to again assist them in collecting suspected insects, and I see no reason why R.A.M.C. officers should not likewise be asked to do their share

in furthering a science daily becoming more important in connection with their special duties. Judging, however, from the results above alluded to, it has occurred to me that a few hints as to the collection and preservation of those insects addicted to blood-sucking, which it so happens are almost entirely confined to the *Diptera*, may be of use to those who may be inclined to assist in entomological work. They are obviously not intended for professed entomologists.

The following somewhat modified definition of the class *Insecta*, to which the order *Diptera* belongs, is from Sharp¹ and Nicholson.² The *Insecta* are defined as articulate animals in which the head, thorax and abdomen are distinct; there are three pairs of legs borne on the thorax; the abdomen is destitute of legs; a single pair of antennæ (horns) is present; mostly there are two pair of wings on the thorax, sometimes only one pair, sometimes none. Respiration is effected by tracheæ.

The above definition therefore excludes at once many creatures frequently regarded as insects, such as spiders, the itch-insect, and the like.

It was calculated by Lord Walsingham, when President of the Entomological Society in 1889, that about 250,000 different species of insects were then known to science, and that probably there were 1,000,000 on the surface of the globe. Since then probably another 50,000 have been discovered, which quite puts it out of the power of any man to become conversant with the whole class, and it compels him to become a specialist not of one order even, but a part of that only.

The *Insecta* are divided into sixteen orders, of which only one, the *Diptera*, now concerns us. About 40,000 species are at present known and additions are being made daily; probably another 200,000 await discovery. They have been defined by Sharp¹ as follows: Wings, two; membranous, usually transparent, and never very large; behind the wings a pair of small erect capitate bodies—halteres—frequently concealed under membranous hoods. No distinct prothorax, all the divisions of the thorax being united to form a large mass (fig. 1). Mouth-parts very variable, formed for suction, not for biting, frequently assuming the form of a proboscis that can be retracted and concealed in a cleft of the underside of the head. The metamorphosis is very great, the larvæ (caterpillars) bearing no resemblance whatever to the perfect insects, but being usually footless grubs or maggots; frequently the head is indistinct, small and retracted. Pupa (chrysalis) variable, either exposed and rather hard, with the appendages of the body more or less adherent;

or enclosed in a scaly capsule looking like a seed, and when extracted, soft and delicate, with the appendages not fastened to the body incapable of movement.

The *Diptera* are, unfortunately, probably less known and have been less studied (at any rate by English entomologists) than any other order of insects, and their arrangements into families and the classification of the genera are by no means settled. Many causes combine to account for their neglect by entomologists. They do not possess the beauty of the *Lepidoptera* (butterflies and moths), or the intelligence of the *Hymenoptera* (ants and bees), and their scavenger habits and repulsive-looking maggots are repugnant to many. Now that their importance in the economy of nature is being recognised, no doubt they will be, and indeed are being, more studied than heretofore, and I should certainly recommend the study of phlebotomic *Diptera* to any one commencing entomology. As these are the most important, medically speaking, I propose dealing with them more particularly. The following are the more important blood-sucking families:—

Culicidæ.—*Culex*, *Anopheles*, *Stygomyx* (Mosquitoes); in the females only; larvæ aquatic.

Chironomidæ.—*Ceratopogon* (Midges); in the female only; larval habits not always definitely known; often aquatic.

Simuliidæ.—*Simulium* (Sand-flies); general in the family; larvæ aquatic.

Tabanidæ.—(Gad-flies).—Apparently general in the females.

Among other families the more important genera are: *Stomoxys*, *Hæmatobia* and *Glossina* (Tsetse-flies); these latter flies apparently live entirely on the blood of vertebrates; the larvæ are nourished inside the mother flies and are born as larvæ, not as eggs.

Culicidæ (Mosquitoes, Gnats).—To the perennial question, What are mosquitoes? the answer may be given that they are gnats that bite, or rather suck. All mosquitoes are gnats, but all gnats are not mosquitoes; the true gnats have no long projecting beak or blood-sucking proboscis. The word mosquito is merely a diminutive of the Spanish *mosca*, and is applied to any small biting insect. It is better, however, to apply the term mosquito to the *Culicidæ* only, and the family is defined by Sharp as *Diptera* with antennæ, with whorls of hair or plumes, which may be very dense and long in the male, though scanty in the female; head with a long projecting proboscis (figs. 3, 4).

The literature of the *Culicidæ* is daily becoming more extensive, and it may be said also more intricate, owing to the difficulty in finding good specific characters to define the groups.

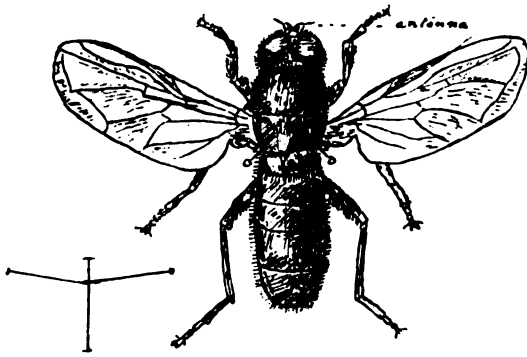


FIG. 1.—A Dipteran. (From Weyenbergh.)

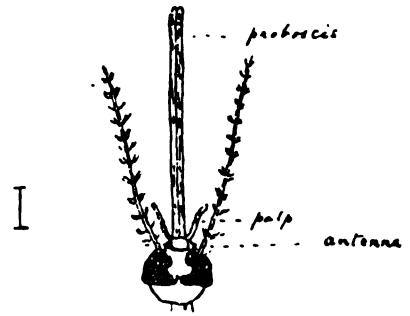


FIG. 3.—Head of *Culex*, female.

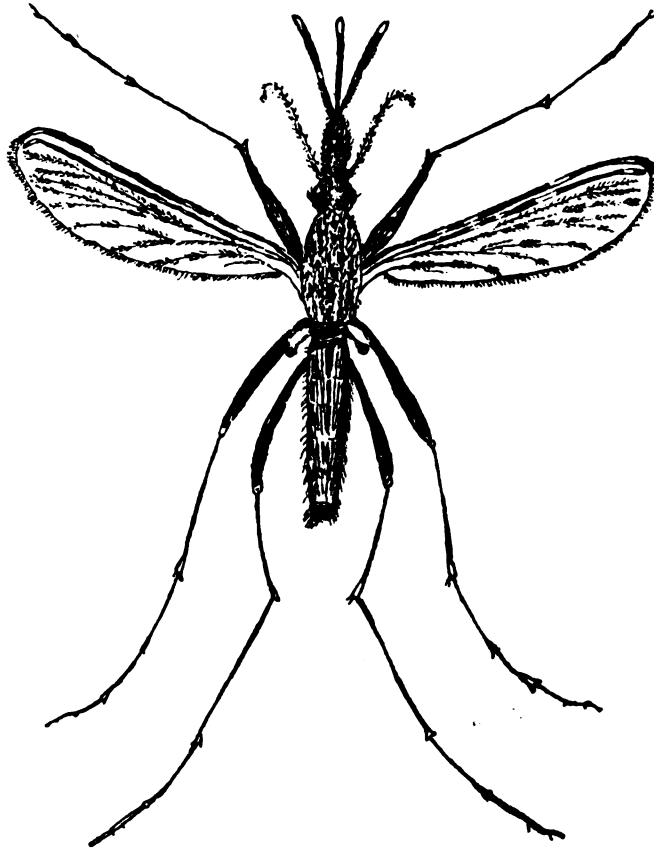


FIG. 2.—*Anopheles fuliginosus*, female. (After E. E. Green.) $\times 15$.

The chief genera it is important to discriminate are *Culex* and *Anopheles*. Structurally, *Culex* may be at once distinguished from *Anopheles* by the palpi of the female being much shorter than the proboscis (fig. 3); whereas in *Anopheles* in both sexes, and also in the male *Culex*, the palpi and proboscis are of equal length (figs. 2, 4).

The wings of *Anopheles* are usually distinctly spotted (fig. 2). The resting attitude of the imago, or perfect insect, is characteristic and cannot be mistaken. Waterhouse, from whose sketch figs. 5 and 5a are taken, truly says, "Whatever may be the attitude of *Anopheles*, it is all in one line. *Culex* is angular, humpbacked." It is also a much more robust insect. *Culex*, furthermore, frequently raises the hind pair of legs, and gently waves them up and down, sometimes for a considerable time, and this enables them to be distinguished from certain harmless non-biting *Tipulidæ* and *Chironomidæ*, which raise the front pair of legs and bear the weight of the body on the posterior pairs.

The *Culex* larva (which corresponds to the caterpillar of a butterfly) is totally different from that of *Anopheles*, as a reference to the outline (figs. 6 and 7) will show, inasmuch as Christophers and Theobald³ have shown that good specific characters are found by the form of the frontal hairs always present on the anterior region of the head.

Dr. Cogill⁴ gives very good reasons for the importance of examining the larvæ in the living state, owing to the frequent matting together of the hairs when mounted in formalin. This is another hindrance to a subject already sufficiently difficult. I can only suggest that large numbers of larvæ be preserved for an examination to be made by experts. *Culex* will breed in any collection of water, however small, dirty and stagnant. *Anopheles* prefers clean water, and is fond of slowly-moving water, such as occurs in ricefields. They are usually very abundant in tanks in India, and indeed any collection of water should be searched for them. The method I adopted for their capture was as follows, I do not say it is the best, but it has the advantage of simplicity:—

Select a tank of any size near a native village which has floating on its surface a collection of water-weed, but not sufficient to form a scum over the surface. Take a "peg" tumbler and skim the surface of the water, preferably clear water near the margin between the masses of weed; do not skim too rapidly, or the contents of the tumbler will be washed out as rapidly as they are taken in; or too slowly, otherwise the larvæ will have time to dive

to the bottom; but with a happy medium begotten of experience. A strange collection of the denizens of the pond will be found in the tumbler, but after allowing the contents to settle, the *Anopheles* larvæ will come to the surface and can then be transferred to another vessel; a French plum jar does admirably. There is no difficulty whatever in recognising an *Anopheles* larva; they lie, when undisturbed, horizontally on the surface of the water, and glide about with a peculiar skating action, tail first, and when in a tumbler of water they almost invariably lie with their tails at the edge of the glass with their heads pointing inwards.

For preservation they should be transferred to clean water, and thence to a glass tube—an ordinary test-tube, not too large, does fairly well. The mixture in the tube should be a 5 per cent. solution of formalin and clean water, which should reach as far as the cork. A 2 per cent. solution would probably do as well as a 5 per cent. It is as well to run a little sealing wax round the rim of the tube, which should have a label attached to it with the locality, altitude and date of capture recorded on it. It is well to bear in mind that an insect without a history is scientifically valueless. *Culex* larvæ can be obtained and preserved in the same way. One test-tube will do for a very large number of larvæ, if plugs of cotton-wool or tissue paper are put in between the larvæ from different localities; whichever is used, it should be tightly rolled to prevent the larvæ getting mixed up or shaken about.

By far the best way to obtain the perfect insects is to breed them from collected larvæ; in fact, it is the only way of obtaining *Culicidæ* in perfect condition and in any quantity, and it is chiefly by this means that new species of *Anopheles* become known to us. There is no difficulty in the process; all that is required is to keep them in a shallow vessel, such as a soup-plate, in the sun, with a sufficiency of vegetable matter for food—the ordinary green algæ found in any tank does very well—and some species occasionally nibble at decayed animal matter, and should be supplied therewith, otherwise they become addicted to cannibalism. They should be looked at carefully daily to ascertain whether any have changed to pupæ (fig. 8), if so they should be at once transferred with a little water to a test-tube, which should be stoppered with cotton-wool. If this is not done systematically the perfect insect may escape, which in a malaria-conveying species is undesirable. The pupal stage only lasts twenty-four hours. If thought necessary they can be preserved in the same way as the larvæ. Many species of mosquitoes can be collected without difficulty and require no

searching for: the searching is frequently done on their side! But for others special search is needed; outhouses, stables, bath-rooms, poultry-runs, and such like should be investigated. *Anopheles* seeks the rafters and roof, *Culex* the walls; but bushes, trees, and jungle generally should be beaten with a walking-stick, and the disturbed insects captured in an ordinary butterfly net; thence they may be either transferred at once to the killing-bottle (see note, p. 129), or, better, to what are known to the faculty as glass-bottom boxes; these are so constructed that when the lid is removed and the box placed over the insect it is induced to fly against the glass, the lid is thus easily adjusted and the insect secured. The perfect insect may be killed either by being transferred to the killing-bottle or a little tobacco smoke may be judiciously puffed into the glass-bottom box, or the box may be very slightly opened and placed in the killing-bottle; either way is efficacious, but by no manner of means use chloroform, as the insects become incorrigibly stiff and nothing can be done with them; likewise carefully avoid packing them in cotton-wool, nothing is worse, the fibres of the wool catch in the minute claws at the ends of the legs, causing them to readily break off. The easiest method for preserving the perfect insect is that already suggested for larvæ, namely, a solution of formalin. The following is the orthodox method, but it requires patience and skill. The material is sufficiently large in most Indian bungalows for lengthened trials, and the weary hours of the long, long Indian day may be profitably employed in obtaining the necessary manipulative dexterity.

Apparatus required: (1) Gun-wad punch, Nos. 12 and 20 bore; (2) card, ordinary visiting cards do well enough, or what is known as two-sheet Bristol board; (3) entomological pins, No. 1 and No. 17—the latter are expensive, 7s. 6d. an ounce, but they are essential; (4) one or two pairs of forceps—the ordinary dissecting forceps will do, but entomological forceps are better; (5) a packet of common pins.

First, punch out a piece of card and pass a No. 17 pin through the centre about half-way up the pin, then turn the insect on to a rough table-cloth back downwards, and carefully insert the pin which has the card on it between the anterior and middle pairs of legs, as nearly in the centre as possible, and push firmly but gently to that amount which experience shows to be sufficient to cause its slight projection through the thorax on the other side. Then turn it over and hold the card with a pair of forceps on the top of a cork, firmly fixed and sufficiently long to keep the short No. 17

pin clear of the table-cloth; pass a No. 1 pin, or ordinary pin, through the card on the side opposite the insect's head and into the cork, then remove it from the cork and push the card up two-thirds the length of the pin. Afterwards attach a label and the operation is completed. The wings and legs may be arranged as nearly as possible as in figs. 2 and 9, by means of a needle fixed in a match for a handle; by drawing the legs gently to the edge of the card the fine claws at their ends will probably catch in the edge and nothing further is required.

Family *Chironomidæ* (Gnats, Midges).—Small or minute flies of slender form, with narrow wings, without projecting rostrum, usually with densely feathered antennæ in the male and long slender legs (Sharp).

The majority are easily distinguished from *Culicidæ* when at rest by the elevation of the fore-legs and by the absence of the long projecting proboscis. Only one genus, *Ceratopogon*, sucks blood, and this in the female only.

So far they have not been accused of conveying disease, but I see no reason why they should not mechanically convey infectious material from one subject to another.

They are mostly extremely minute flies (fig. 10), and known to everyone from the annoyance they cause on summer evenings, particularly beneath the shade of trees. They are usually known as midges, and their bites frequently cause intolerable irritation. The life-history of the majority of the species is not known; some larvæ are aquatic and the resulting flies have naked wings, whereas the terrestrial larvæ produce flies with hairy wings. Miall⁵ has worked out the life-history of an aquatic species and figures the larvæ. He quotes Laboulbène⁶ as having observed the larva of *Ceratopogon Dufouri* as living during its early stages in the sap which flows from wounded elms. Jos Mik⁷ has also worked out very thoroughly the life-history of *Ceratopogon hippocastani*, and states that both the larva and nymph live in their early stages in the exuding sap of *Æsculi hippocastani*; he gives figures of the insect in all its stages. The insect figured is from a coloured drawing by Westwood.⁸ The members of this genus and those of the *Simuliidæ* are too small to mount in the manner suggested for *Culicidæ*. After the pin has been passed through the card as above indicated the insect should be laid on its side and the pin passed through the pleuron—the pleuron is beneath and rather anterior to the wing. If this method should be found impracticable on account of the minute size of the insects, the following may be tried, but it

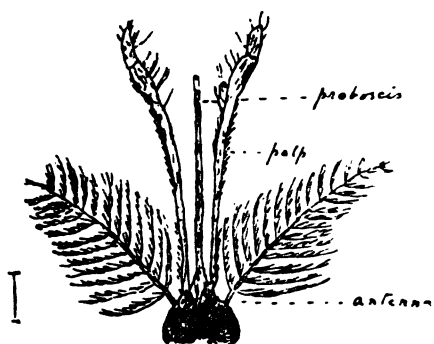


FIG. 4.—Head of *Anopheles*, male.

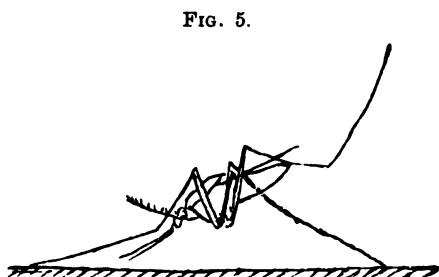


FIG. 5.

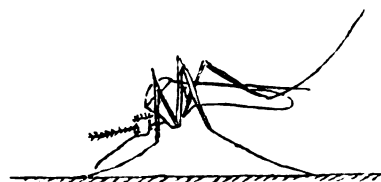


FIG. 5a.

FIG. 5, 5a.—Resting Position of *Anopheles* and *Culex*.

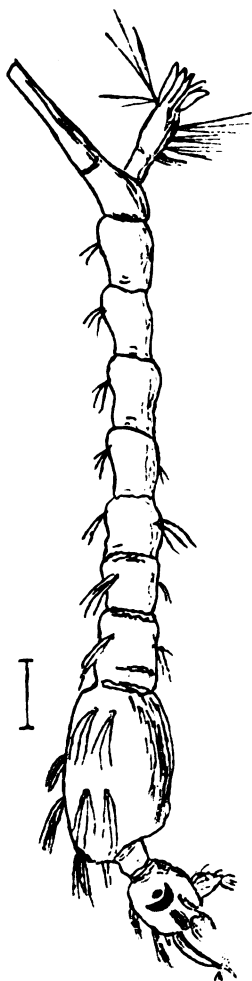


FIG. 6.—Larva of *Culex*. (After Miall.)

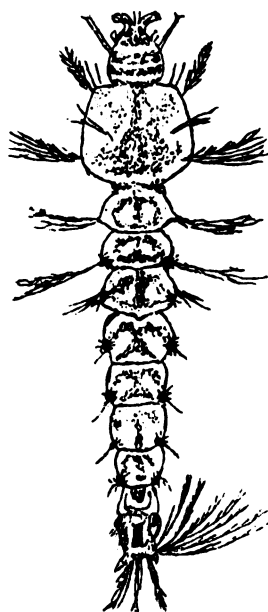


FIG. 7.—Larva of *Anopheles*. (After E. E. Green.)

requires an unusual amount of patience and dexterity. Mr. Bignell, the well-known hymenopterist, employs it very successfully in his probably unique collection of *Cynipidæ* and *Chalcididæ*, many species of which are scarcely visible to the naked eye. When studying his collection recently I made a note of his method, which I describe as nearly as possible in his own words. To kill them, have a basin or breakfast cup three parts full of boiling water, invert the box containing the flies over it and jerk them into the water. Many will alight on it with wings expanded. If they do it will save a lot of trouble. The fly is then removed into spirits of wine. From this it should be floated on a slip of glass, taking care that it is on its back; then arrange the wings, legs and antennæ as wished to be seen. When mounting them on a card a needle and a small sable hair-brush (size No. 1) should be used. In a few minutes the spirit will have evaporated; the fly can then be lifted off with the needle and removed to the card, and gummed down to its permanent lodging. The best gum for this purpose is gum-tragacanth, because it leaves no gloss on the card. It is prepared with water, ten grains of gum, quarter of a grain of arsenic, mixed with two ounces of water. The arsenic is used as a preservative of the gum and to prevent other insects attacking the mounted objects. Three-sheet Bristol board is the best for mounting insects upon.

Family *Simuliidæ* (Sand-flies, Buffalo Gnats).—Small, obese flies with humped back, rather short legs and broad wings, with short, straight antennæ destitute of setæ; proboscis not projecting (Sharp). There is only one genus, *Simulium*. They are only too well known to whoever has served in India. I remember their being particularly obnoxious in Peshawar. Their bite is far more irritating than that of the mosquito. They have also seemingly the faculty of creeping through the meshes of an ordinary mosquito net, and being almost colourless are extremely difficult to detect. They rest during the day on the walls of the bungalow, and if these are white they may be discovered by carefully scanning the walls from the side. It is advisable to frequently whitewash the walls, as this seems to be the best method of getting rid of them. In some parts of the world these insects occasionally appear in dense swarms and cause serious loss to the owners of stock, owing to the poisonous nature of their bites, which drive cattle frantic. In India they are an intolerable nuisance, yet no one hitherto has made a study of them in that country. One of our leading dipterologists writes to me, "Practically nothing is known about the Indian species of *Simulium*, though as most of us know to our cost, the genus occurs in numbers in the

"Shiney"; only one species has been recorded, viz., *Simulium indicum*, Becher, *J.A.S.B.*, liii., 1884, p. 199, plate xiv., Assam, though probably fifty species occur within Indian limits." Miall⁵ has written a most interesting account of our English species, and states that the larva (fig. 11) prefers brisk and lively streams with plenty of weeds, and are most numerous where the current is brisk. They would probably be found in India in the small irrigation channels usually made in Indian gardens. In Peshawar these are, or were, particularly numerous, and in the cold weather at any rate always full of running water for the sake of the roses, which are the pride of the cantonment.

Family *Tabanidæ* (Horse-flies, Gad-flies).—Proboscis fleshy, distinct, enwrapping pointed horny processes; palpi distinct, terminal joint inflated, pendant in front of proboscis. Antennæ projecting, four-jointed, second joint very short, third variable in form, fourth forming an indistinctly segmented continuation of the third, but not ending in a bristle (Sharp).

These are well-known flies and usually sufficiently numerous in most woods in England in summer to be annoying to horses. The smaller species (*Hamatopota*) occasionally bite human beings, but not, as a rule, if horses are available. So far they have escaped condemnation otherwise than as serious nuisances, but it is not improbable that they will be convicted eventually as conveyors of disease. Although 1,400 or 1,500 different species are known their larvæ have seldom been described; they appear to be predaceous, attacking and sucking the juices of insect larvæ and worms. Indirectly they may be of some benefit, but this is counteracted by their blood-sucking propensities. To anyone studying surra this family should receive some attention. In the Burma terai and up to 4,500 feet they swarmed in certain parts, the cavalry horses being badly punished; even the thick-skinned Burma pony did not entirely escape.

Stomoxys and *Glossina*.—With the exception of the English species of the former (*Stomoxys calcitrans*), which is very like an ordinary house-fly, except that it bites, I have no personal knowledge of either of these genera, except as museum specimens, and do not, therefore, presume to deal with them. They can be preserved by any of the aforementioned methods, or can be simply pinned through the centre of the thorax like a butterfly, and if deemed necessary, set like one. Representative insects of the above were figured in the ROYAL ARMY MEDICAL CORPS JOURNAL, vol. i., No. 6.

I may here mention even a simpler method than any of the above, though not so good; it is to kill the insect and wrap it in a piece of tissue paper with the date and locality, and place it in sawdust which has previously been well baked and a few drops of carbolic acid added. The box containing the sawdust should always

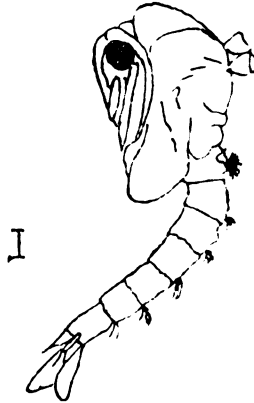


FIG. 8.—Pupa of *Anopheles*. (After E. E. Green.)

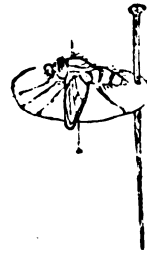


FIG. 9.—A Dipteran Set.

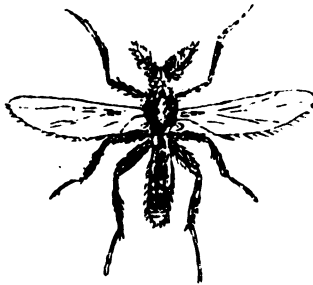


FIG. 10.—*Ceratopogon palustris*.



FIG. 11.—Larvæ of *Simulium*. (After Miall.)

be kept quite full and well-pressed down (insects will stand a lot of steady pressure), otherwise the insects will get loose and be damaged.

Family *Hippoboscidae*.—Wings very variable, sometimes present and large, then with waved surface and thick nervures confined to the anterior and basal part; sometimes mere strips, sometimes entirely absent (Sharp).

This family contains an irregular assortment of insects, about which very little is known; some of them infest or are parasitic on birds, swallows and swifts being particularly victimised. The best known are the Sheep-tick and Horse-fly, or as it is usually called in India, the Horse-tick. "Very little seems to be known as to the natural history of this fly" (Sharp). The Horse-tick in certain parts of India and Ceylon is a distinct pest, and it would not surprise me to learn that it is responsible for one of the diseases which affect horses in those countries. Our ignorance of many, I might say most, of our blood-sucking *Diptera* is very great. India is practically a virgin field for anyone inclined to study this group, either from a medical or entomological standpoint. Fortunately *Diptera* are mostly small insects, and a very considerable number can be put into a collecting-box of ordinary dimensions. The collection may be kept in proper store-boxes with a piece of camphor or naphthalin in one corner to keep out undesirable insect pests, or any ordinary cigar-box can be readily converted into a store-box by lining the bottom with solar pith (half inch thick) or pieces of cork securely fastened with glue. The box and contents must be kept well away from ants, which are terribly numerous and destructive in the Tropics. It is better, unless one is making a special study of the group, to send the insects home to a specialist as soon as possible after they are captured to save injury from mites and mould. There is no difficulty and little danger of insects coming to grief in the post, and few precautions are needed. My own method is to use only small boxes, say six inches by four inches, packed inside a larger one, so that there is a space of half an inch to an inch all round. This space is filled with tightly-rolled pieces of paper the size of a marble, which act as buffers to the blows of the Post Office. The lid of the outer box should be screwed, not nailed, and the whole wrapped round with brown paper. The address should be written and stamps placed on a label not on the box. It is as well to write on the outside, "Insects only, value *Nil*."

NOTE.—To make a killing-bottle, take any wide-mouthed bottle and fill it to the depth of about half an inch with plaster of Paris, then put in a mixture of equal parts of plaster of Paris and powdered cyanide of potassium to the depth of another inch; pour over this plaster of Paris and water, mixed to the consistency of thick cream, to the depth of about another inch. The cork should be kept out of the bottle until the plaster of Paris has set, afterwards it should be kept carefully corked.

All entomological apparatus can be procured at Messrs. Watkins and Doncaster, 36, Charing Cross, Strand.

130 *Collection and Preservation of Phlebotomic Diptera*

The literature of the *Culicidæ* is now so extensive that it is difficult to recommend any particular book, but personally I should hesitate to purchase an elaborate and expensive treatise on the subject; such are out of date almost as soon as published. I strongly recommend that portion of the "Cambridge Natural History," edited by Dr. Sharp, which treats of insects generally, and Miall's "Natural History of Aquatic Insects," both invaluable works.

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 - ⁴ COGILL, "The *Anopheles* of Karwar," *Journal Bombay Nat. Hist. Soc.*, vol. xv., p. 328.
 - ⁵ MIALL, "The Natural History of Aquatic Insects," p. 156.
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 - ⁷ WEIN, *Ent. Zeitung*, p. 183, tag. ii., "Zur biologie von *Ceratopogon*," Meig.
 - ⁸ STEPHENS' "Entomology," 1867, Supplement, pl. 42, fig. 8.
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THE ANTI-MALARIAL OPERATIONS IN MIAN MIR.

BY LIEUT.-COL. G. M. GILES.
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As I have quite recently written at some length on the problem of anti-malarial sanitation in the cantonment of Mian Mir in the Punjab, it is scarcely needful here to do more than generally indicate the impressions gathered in a visit to that place during the last cold weather.

It will be truly admitted that as yet but little has been effected in the way of practical results by the operations that have been conducted there during the last two years, and in my humble opinion the reason of this is to be found in the fact that Capt. James, I.M.S., who initiated the work, desired to carry out his operations in such a manner that the methods adopted might be applicable to the country generally. I understand, from correspondence with him, that very rightly, considering that "the very life of the population of the Punjab depends on canal irrigation," he refrained from the very obvious step of recommending the abolition of canal irrigation within cantonment limits.

Now, personally, I strongly doubt that it is possible or desirable to attempt to devise a method of action applicable to any large area, for local conditions necessarily vary so widely, that to secure success it is essential to study closely the conditions of even separate buildings.

Nothing is more common than to find that closely adjacent parts of the same town or village may differ to a startling extent in their malariousness. The invaluable "*Atti della Societa per gli Studi della malaria* of Rome," are full of instances of this sort, and it is unfortunate that the studies of the local manifestations of malarial endemicity, with which its pages are mainly filled, are not more widely read by English students; for they show clearly that endemic malaria is a strictly local manifestation; and that it is by strictly local measures alone that we can expect to successfully combat the disease. There are, of course, certain general principles which may be generally applicable to certain classes of locality; and as a cantonment is designed to be a place of residence for soldiers, and not as a field of operations for an agricultural community, there can, I think, be no doubt that one of these general principles is that canal irrigation should be absolutely effaced within the confines of every military station. The word "effaced"

is used advisedly, for to merely close the canals will not meet the necessities of the case, as to do so would merely limit the prevalence of malaria to a period corresponding with, but not, of course, coincident with, the rainy season, during the continuance of which the long disused channels and other excavations incidental to this form of irrigation, must necessarily form a collection of puddles which would more than tax the resources of a "mosquito brigade," were even the entire garrison sworn in as anti-malarial constables. Until canal irrigation is done away with I am very sceptical as to any practical good being effected in the direction of the destruction of mosquitoes; though much might be done, no doubt, in other directions. It must not be forgotten, too, that malaria is by no means the only disease that finds its opportunity in dampness of soil and climate, and that such a sodden condition of the entire environment, solid and gaseous, as that brought about by canal irrigation is universally recognised as generally unhealthy in all climates by every authority on sanitation.

For those who must needs work under such conditions or starve, there is no alternative but to make the best of a bad business, but the fact that millions of the population are doomed to such a fate, offers no excuse for subjecting soldiers to the same, but with them perfectly avoidable, conditions.

Owing to the fact that wintering larvæ are almost confined to collections of water of considerable dimensions, and that scarcely any such are to be found in and about Mian Mir (this cantonment was about the only place in which I failed to find them during my winter ramble in Northern India), so that it may be admitted that a good deal has been done to improve the sanitation of the place from our special point of view, and I believe that if the great stumbling block of irrigation were removed, there would be comparatively little difficulty in greatly reducing the number of mosquitoes by the systematic employment of now well-known methods. That these methods should be systematically worked in every military station goes without saying, but I am strongly of opinion that in the case of the British soldier in India, striking immediate results can only be expected by the adoption of properly contrived wire gauze protection for barracks.

In any case it is a matter of extreme urgency that immediate measures should be taken for the isolation of malarial patients in special wards, rigidly protected against the entry of mosquitoes, for as matters now stand, it is difficult to see how surgical and general medical cases can possibly escape infection, treated as they now are

in the same building, and often in the same ward, as malarial patients, with, practically speaking, no protection whatever against mosquitoes, which, more often than not, find their way into the wards in enormous numbers.

Nor is the danger confined to the general sick in hospital, for quite commonly the hospital is placed in close proximity to the barracks, which are thus provided with a ready-made focus of infection, whose efficiency can scarcely be doubted.

The General Hospital at Mian Mir is, for example, placed close between the Infantry barracks and a large Native bazaar, and hence can hardly fail to serve as a most efficient agent in diffusing the disease impartially among the European and Native community.

ON HÆMORRHAGE FROM THE BOWEL IN MALARIAL DISEASE.

BY MAJOR S. F. CLARK.

Royal Army Medical Corps.

THE following remarks may be of interest, as the subject deserves more attention than it seems to have received from the profession. I say this because, though the life of a patient attacked by this malarial bleeding may be in great peril, yet many text-books either ignore the subject altogether, or else do little more than merely mention it. More surprising still, however, is the fact that the complication has escaped notice by many medical men resident in the tropics. Why this should be it is hard to say, for anyone who has ever been called upon to treat a severe case of this kind is not likely to forget the hand to hand struggle with death that ensues. I have, however, from time to time noticed that officers of our corps have met with cases of this nature, and it is probable that it will gradually be more generally recognised as one of the dangerous complications of malaria. It is possible that of late years such cases may have become of more frequent occurrence, and support is given to this view of the matter by the fact that some officers I have served under of high rank and great tropical experience had not met with such occurrences until quite lately. I served in India for six years, and though I saw and treated hundreds of cases of malarial disease, it was not until my last year, in Karachi, that I met with a case of the nature under consideration. This was towards the end of 1893. In 1894 I saw a man at Deolali who was convalescent from this hæmorrhage, and in 1896 I treated a very severe case at Dover in a soldier just returned from the Ashanti expedition. In Hong Kong some six or eight cases have come under my notice, one a soldier's child, the remainder adults in the garrison hospital. In Karachi the number of cases quickly reached double figures, and though the amount of malaria in the station was great, and the type severe, yet it is hard to explain why I passed five years in India without seeing or hearing of this complication, and then met with quite a run of it. The Karachi hospital records did not show any case of this hæmorrhage as having occurred in previous years, and it had not been noticed among the large native population of the town. The civilian practitioners in Hong Kong do not seem to be familiar with it.

As a rule this bleeding occurs in patients who frequently suffer

from malarial fever, and it generally comes on soon after their admission to hospital. In a large percentage of cases it occurs in the "detained ward," where patients are placed who report sick after hospital hours. There are no signs by which hæmorrhage may be predicted, but in one case of malarial cachexia in which an attack of ague was in progress, I suspected that bleeding had occurred by finding the patient in a collapsed condition, with subnormal temperature. In a few minutes this supposition proved to be correct. In the great majority of cases, however, the presence of blood in the bed-pan or stool is the first sign of danger. The only advice I can give is to remember especially the possibility of this hæmorrhage in all cases in which the patients frequently suffer from malarial attacks; the new cases seem much less liable to it. Bleeding may occur with either a raised or a normal temperature.

A typical case may be described thus: A man is brought to hospital with a sharp attack of malarial fever, generally tertian, and he states that he has suffered a good deal lately from "fever and ague." The case seems to be similar to dozens of others which are in hospital, and the usual treatment is ordered. Presently he asks for the bed-pan, and on removing it the stool is found to be copious, quite liquid, and of a bright red colour; it is, in fact, almost pure blood. The copious nature of the stool causes alarm, which is not lessened when, after a short interval, another similar motion is passed, followed later on by more. It would appear as if the whole of the blood in the patient's body was being passed *per rectum*. An act of vomiting, so common in the hot stages of malaria, is very liable to be followed by an evacuation of blood from the bowel. The stool comes away quickly and easily, without pain. In some cases the bloody motions are preceded by two or three liquid stools devoid of blood, but in other cases the first motion passed consists of blood. If the hæmorrhage be not checked the patient becomes collapsed and dies, but a fatal termination is rare when treatment is prompt, and cases which seem quite hopeless can be pulled through. The presence of vomiting is a very serious matter; it greatly hampers treatment, as any medicine given by the mouth is apt to provoke vomiting and so bring on a movement of the bowels with consequent loss of blood. The restlessness of the patient is also an unfavourable factor. The later phases of the case vary with the effect of the treatment, and are similar to the symptoms attending great loss of blood in any other form. But even though the patient is almost pulseless and apparently in a hopeless condition, yet his life should not be despaired of.

The treatment of this grave affection must be prompt and energetic. Absolute quiet of the body must be obtained as far as the restlessness of the patient will permit. He must be laid flat on his back in a comfortable bed and warned of the necessity of quiescence. The motions should be received in a slipper bed-pan placed very gently in position, and the patient in no way disturbed by cleansing operations. To check the bleeding both external and internal treatment is advisable. The whole abdomen should be covered by an ice-bag or bags carefully adjusted. In my own experience this external application of ice has been of the utmost value. To give the patient ice to suck instead is an utterly inadequate procedure. Astringents, notably tinc. opii and liq. ext. ergot, should be given by the mouth. In the hypodermic administration of ergotinum we have a powerful therapeutic agent, especially when the occurrence of vomiting renders any administration by the mouth impossible. The use of this drug should never be omitted in a severe case; it can be injected into the thigh muscles without any disturbance of the patient. All these drugs should be used freely and in full doses. Rectal injections of ice water I have found to be worse than useless. The use of chloride of calcium is also indicated, but I have never tried it. As a rule the patient does not require nourishment, but if the case is prolonged, meat essences should be given. The question of alcoholic stimulants is a difficult one, as their use may possibly increase or renew the blood flow. Usually, they ought to be withheld as long as possible. The after treatment includes rest in bed with avoidance of movement. Astringents need to be given for a day or two after all bleeding has ceased, while quinine should be freely administered. The ice-bags may be discontinued twelve hours or so after the last appearance of blood. The food should consist of meat essences and milk. Once the hæmorrhage has definitely ceased, it has no tendency to recur. Like many other symptoms these malarial hæmorrhages differ greatly in degree. They range from a case such as that just described, where the bleeding is so copious and frequent that death must quickly ensue if treatment is unavailing, to a case where only one or two stools are passed, and recovery seems to be spontaneous.

In the one fatal instance of which I have any knowledge, an acute case with copious hæmorrhage, the mucous membrane of the whole intestinal tract from stomach to cæcum was found to be in a condition of engorgement. This extreme congestion gradually increased in intensity from above downwards, while the mucous membrane was thickened, opaque, and of a deep purple colour, with almost black patches on the *valvulæ conniventes*. About five or

six inches down the jejunum were a series of very small shallow ulcers with ragged edges. The same condition existed throughout the large intestine, except that there were no ulcers. It is doubtful whether the great hæmorrhage that occurs can be explained by the presence of small ulcers, it rather appears to come from the capillaries of the acutely congested intestinal mucous membrane as a general oozing or weeping. May it not be that the intestinal hæmorrhage is due to changes in the blood caused by the malaria, just as hæmorrhages occur in the acute infectious diseases? Roberts includes it as a cause of "diseased conditions of the blood," and other writers hint at certain blood cachexiæ being a cause of the same symptom. In malaria we have not only a blood parasite, but also, in severe cases, a definite hæmolysis. Under these circumstances I see no difficulty in understanding how the blood reaches the inside of the bowel even when *post-mortem* examination does not show any great breach of surface. It clearly makes its way through the capillaries of the mucous membrane without any solution of continuity occurring in that surface. In an inflamed tissue, not only fluids but the blood corpuscles themselves make their way through the walls of the vessels. In this way a large quantity of blood escapes into the cavity of the bowels from the acutely congested capillaries distributed to the intestinal mucous membrane, and then is passed *per anum*. A noticeable feature of the blood passed in these cases is its disinclination to coagulate. After having been kept for hours in a vessel it is just as fluid as when first passed.

One meets with men who have been many years in the tropics who are inclined to be sceptical about this malarial hæmorrhage, on the ground that they have not met with cases themselves, and they are inclined to put it down to dysentery or to enteric fever. I desire to state most emphatically that the condition I have described is neither dysentery nor enteric fever, but is a true blood flow due to malaria. The stools are not a mixture of blood and slime but are pure blood, while the most convincing fact is that the bleeding lasts only for a few hours and is not a prolonged process like dysentery. There is also an absence of straining and tenesmus. That it is not enteric is shown by the fact that the illness is short and sharp: as a rule there is no further fever when the hæmorrhage has ceased. In enteric, bleeding comes on in the later stages, in these malarial cases it appears in a few hours after admission to hospital.

I submit these observations in no dogmatic spirit, but mainly in the hope of directing the attention of my brother officers serving in the tropics to a symptom and class of case which seems to me to have been largely overlooked.

NOTES ON 1,140 CASES OF GUNSHOT WOUND.

By LIEUT.-COL. G. H. YOUNGE.
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From December 9th, 1899, when No. 15 (late Irish Brigade) Field Hospital opened for the treatment of sick at Frere, to July 8th, 1901, when I handed over command of the unit to Lieut.-Col. W. W. Pike, D.S.O., at Potchefstroom, 1,140 cases of gunshot wound passed through the hospital. Some brief notes on these may be of interest to readers of our Journal.

The following table shows the wounds classified according to the regions involved and to the actions in which they were received :—

Regions	Colenso	Spion Kop	Pieter's Hill	Minor Actions	Total	Percentage of Total	Deaths	Percentage of Deaths to Cases
Head	25	38	21	8	92	8·0	12	13·0
Face	8	10	10	2	30	2·6	1	3·3
Neck	6	12	7	2	27	2·4	—	—
Chest	19	29	21	16	85	7·4	9	10·6
Abdomen	23	16	19	8	66	5·8	12	18·2
Back and spine ..	21	15	14	10	60	5·3	3	5·0
Upper extremity..	83	89	82	34	288	25·3	—	—
Lower extremity..	129	154	157	52	492	43·2	1	0·2
Total	314	363	331	132	1,140	100·0	38	3·3

Of the 1,140 cases, 87, or 7·6¹ per cent., were caused by shell, and 1,053, or 92·4 per cent., by rifle bullets. Classified according to the degree of severity, 603 were slight, 366 severe and 171 dangerous; which gives respectively a percentage of 52·9, 32·1, and 15·0. The percentage of dangerous wounds is certainly less than one would have expected.² The great preponderance of wounds of the lower extremity is also a remarkable feature. This was probably due to the fact that our men had almost invariably to attack in the open, where there was little or no shelter, and that the Boers almost invariably fired from steep ridges or kopjes and

¹ Referee's footnote: This is about the same ratio as was observed in the late Spanish-American War.

² The proportion of wounds in the upper and lower extremity was as nearly as possible similar in that of the wars of the last 100 years

aimed low. It is interesting to note how closely the proportion of wounds of any given region approximate in the different actions.

A by no means small proportion of cases presented multiple wounds. This was especially noticeable at the battle of Colenso, where, from the nature of the ground and the complete absence of cover, many men were hit time after time as they lay on the ground wounded. The number of wounds varied from two to eight. One officer had eight wounds; another had three Mauser wounds, one of which perforated the abdomen, passing through the ascending colon. As he lay on his face on the ground a shell burst over him and his back was simply riddled with tiny fragments of shell. He made an uninterrupted recovery and is now in perfect health. These multiple cases were returned under the wound which seemed most immediately dangerous or else most likely to leave some permanent bad effect. For instance, the officer referred to was shown under the head of "wounds of the abdomen."

SHELL WOUNDS.

As previously stated 87, or 7·6 per cent., of the wounds were caused by shell. Considering the accuracy and severity of the Boer artillery fire in the early stages of the war, this percentage is very small, and bears out the opinion that against troops in the open the effect of artillery fire is chiefly moral. Many of the shell wounds were truly ghastly. A few of the cases may be specially mentioned. At Spion Kop a man was struck, apparently by an unexploded shell, over the centre of the hepatic region. The shell passed directly backwards carrying away most of the lower ribs and practically the entire liver. On admission the man was quite conscious and rational. There was little or no hæmorrhage, and, considering the nature of the wound, surprisingly little shock, but intense pain. The wound was cleansed and covered with a temporary antiseptic dressing. Morphia, gr. $\frac{3}{4}$, with atropin, gr. $\frac{1}{60}$, was given hypodermically. This relieved the pain and permitted the patient to die in peace. After the final assault on Pieter's Hill a Boer prisoner was brought in from the trenches. A large fragment of lyddite shell had struck the upper part of the sternum on its right side. The fragment passed upwards, outwards, and to the right, carrying away the right side of the sternum, the cartilages and anterior ends of several of the upper ribs and the muscles in front of the shoulder. The upper third of the lung was lying bare, but uninjured, at the bottom of the wound. A second piece of the same shell had shattered the lower end of the

right femur and opened the knee joint. The wounds were washed with strong perchloride solution, thickly dusted with iodoform, and then covered with salicylic wool, the leg being secured on a long splint. During the five days he spent in the hospital there was a moderately high temperature, but in other respects he was progressing most favourably when transferred to Pietermaritzburg.

As an instance of recovery from very extensive injuries the following case deserves mention. At the battle of Colenso a man of the Border regiment was struck on the right side of the pelvis by an unexploded shell. This passed directly backwards, carrying away all the muscles above and behind the hip joint, together with almost the entire body of the ilium. The pelvic fascia, the upper end of the femur and the hip joint were extensively exposed, but the joint was uninjured. The question of amputation through the hip was discussed, but the late Sir William MacCormac, who kindly saw the case in consultation, strongly advised against the operation as he did not believe that the patient would live through it. A number of detached and loosely adherent fragments of bone were removed and the cavity was swabbed with strong perchloride solution. The surface of the wound was then covered with salalembroth wool. Three large, clean towels were afterwards wrung out of perchloride solution and packed into the wound. The pelvis was then firmly bandaged, and the patient was at once placed in the hospital train and sent down to the general hospital, Pietermaritzburg. Twelve months afterwards I was able to trace the subsequent progress of the case. After several pieces of dead bone had been removed the wound granulated up remarkably quickly. On January 26th, 1900, Lieut. G. C. Phipps, R.A.M.C., performed a plastic operation, bringing the skin from both above and below over the wound. On March 22nd the patient was allowed up on crutches. On April 30th he left for England. A day or two before leaving Pietermaritzburg he walked a distance of three miles without difficulty.

On one or two occasions we had an opportunity of witnessing the effects of lyddite on unwounded prisoners. On the night of February 28th, 1900, a young Boer lad was picked up in the trenches on Pieter's Hill in a semi-unconscious condition. A lyddite shell had burst close to him and knocked him over. When admitted to hospital he was in an attitude of rigid flexion and was semi-unconscious. No wound of any kind could be detected, but the skin on all exposed parts was stained of an ochrey-yellow colour and washing had no effect on the stain. As the unconsciousness

passed off the lad was found to be reduced, at least temporarily, to a state resembling idiocy.

Many wonderful escapes from both shell and rifle bullets were seen. The following is, perhaps, the most remarkable of these. At the battle of Val Krantz an Artillery driver was sitting on a spare horse near the hospital when a 6-inch shell struck the back of the saddle and burst. The horse was almost blown to pieces. The rider was thrown some distance and the back of his jacket was set on fire. The man was rather dazed and hysterical, but the only injury I could find were two tiny scratches on the small of the back exactly like those caused by finger nails.

BULLET WOUNDS.

As stated above, 1,053, or 92·4 per cent., of the wounds were caused by rifle bullets. As a rule, flesh wounds caused by the Mauser bullet were very "humane." This was far from being an invariable rule, however. In many cases large conical-shaped masses of tissue were carried away, the exit wound being occasionally several inches in diameter. An interesting point was that wounds of this kind, which were probably caused by expanding bullets, were not seen at the battle of Colenso, but were frequent at Spion Kop and Pieter's Hill.

When the Mauser bullet came in contact with bone the injuries it caused were often very severe. The bone was not infrequently splintered extensively, and occasionally portions of the shaft were blown clean away. In two cases of gunshot fracture of the humerus, for instance, three to four inches of the centre of the shaft was reduced almost to a powder. The rapidity with which simple fresh wounds healed was often surprising. At the battle of Colenso an officer was struck in the centre of the right groin two inches below Poupart's ligament. The bullet passed horizontally backwards, apparently between the bone and the femoral vessels, and emerged at the centre of the gluteal region. On the eleventh day he was again doing duty with his regiment. The wounds of entrance and exit were marked only by a tiny pink dimple. The only inconvenience complained of was a slight feeling of weakness in the leg after he had walked some distance.

In the actions following Colenso we frequently saw a green stain on the men's clothing at the point where bullets had entered. They had, in fact, been wounded by the so-called "poisoned" bullets. I picked up many specimens of these. The green coating

appeared to me to be verdigris, which, so far as I could judge, had not the slightest effect in retarding the healing of the wounds.

WOUNDS OF THE HEAD.

These gave ninety-two admissions. With few exceptions the wounds were perforating, the bullets passing clean through the head, generally from before backwards. The cases were amongst the most interesting seen during the campaign. That a bullet could traverse the brain without producing any immediate symptoms was as surprising as it was unexpected. Yet this occurred in several cases. Two instances may be given. A man was wounded at the battle of Colenso whilst lying down. The bullet entered through the parieto-frontal suture about half an inch to the right of the mesial line. It passed downwards and slightly forwards through the frontal convolution, the orbit and the hard palate, and was found projecting under the skin in the sublingual region, from which it was removed without difficulty. There was extensive effusion of blood within the orbit, which caused marked protrusion of the eye and lids. The patient was perfectly conscious, could give an accurate account of what had happened immediately after he was wounded, and complained only of slight aching at the wound of entrance. The following morning he stated that he felt quite well, and rather resented being sent to the hospital train on a stretcher, as he wished to walk there. In the second case a man was wounded at Spion Kop, also whilst lying down. The bullet entered at almost the same point as in the latter, but took a slightly more forward course and escaped through the mouth, carrying with it the two upper central incisor teeth. There were the same absence of symptoms and the same effusion of blood into the orbit with protrusion of the eye and lids. The next morning I found him waiting on a badly-wounded comrade, and he stated that he felt quite comfortable and free from pain.

It was, I believe, the general experience throughout South Africa that preventive trephining should be performed in all gunshot wounds of the cranium. This was especially necessary in "gutter" wounds, owing to the great depression and fissuring of the inner table which occurred in these cases. In the Field Hospital, however, trephining was only done when the symptoms were too urgent to admit of any delay. The following may be given as a case in point. A man was wounded on the first day of the battle of Spion Kop. The bullet entered one inch above and to the left of the external occipital protuberance. It passed forwards and outwards

and emerged over the motor area. The patient lay in an attitude of flexion deeply comatose with loud stertorous breathing. Brain matter constantly oozed from the anterior wound under the dressings. At 7 p.m. he seemed quite moribund. Captain E. M. Pilcher, D.S.O., at once trephined, removing several fragments of bone, which were embedded in the brain, and elevating several depressed portions. The following morning the patient was conscious, but unable to speak. He remained in this condition until February 25th, when he was transferred to No. 4 Stationary Hospital.

WOUNDS ON THE FACE AND NECK.

These combined to give fifty-seven admissions. By far the larger number of them were slight, the bullets having glanced past some part of the face or neck, inflicting superficial wounds. In a fair proportion of the cases bullets passed diagonally from above downwards, or from side to side, involving the larynx.

In two at least both the base of the tongue and the larynx were involved. Both were attended by considerable distress and dyspnœa. One of the patients, after a fit of coughing, brought up a Mauser bullet which had lodged in the larynx. In none of the cases, so far as could be ascertained, were important vessels or nerves involved, and in only two of them was the lower jaw fractured. Two of the cases may be mentioned as they were somewhat curious. An officer was wounded in the final assault on Pieter's Hill. A fragment of shell struck the left eye, completely smashing the globe and lodging in the orbit. As he was being carried to hospital the patient extracted the fragment with his fingers and brought it in with him. It measured one inch in its shortest and one and a half inch in its longest diameter. The curious point was that the eyelids were quite uninjured, and no signs of fracture of any of the surrounding bones could be detected. Captain Pilcher at once enucleated the damaged globe and the patient made an excellent recovery.

In the second case a man was accidentally wounded at Potchefstroom by a Lee-Metford bullet, at a range of about 20 yards. It struck exactly on the tip of the nose, passed backwards between the tips of the cartilages, across the right nasal fossa and emerged midway between the lobe of the ear and the angle of the jaw. The latter was uninjured. For several days there was great swelling of the face, the features being almost obliterated. This, however, quickly subsided and the patient made a complete and rapid recovery.

WOUNDS OF THE CHEST.

Under this head there were eighty-five admissions with nine deaths. They were all penetrating wounds, whilst in the great majority of them the bullets had passed clean through the chest, generally from before backwards. In the fatal cases death occurred rapidly from internal hæmorrhage. If the patients escaped this danger recovery often took place with wonderful rapidity.

The symptoms present and the gravity of the cases depended largely on the position of the wound. As a rule the nearer this approached to the root of the lung the graver was the prognosis.

I have no doubt that many of those in whom this part of the lung was involved died rapidly and perhaps suddenly on the field from hæmorrhage, and were not, therefore, seen in the hospitals. When cases of this kind were brought in alive they generally proved rapidly fatal from the same cause. Still, however, cases were seen in which it seemed almost impossible that the root of the lung could have escaped injury, and yet in which the symptoms were not such as to occasion any grave anxiety. When the apex or the outer sections of the lung were alone involved the symptoms were oftentimes quite negative. As a rule dyspnœa was not a prominent symptom and, apart from hæmorrhage into the pleura, was of short duration; it might even be quite absent. Hæmoptysis was oftentimes entirely absent, and when present was generally slight and of short duration. Superficial emphysema was very rare. Indeed, I can only recall one case in which it was present to any marked degree. In our cases hæmothorax was also exceptional. When it did occur it was indicated by rapidly increasing dulness and loss of vocal resonance. Fracture of the ribs or wound of the intercostal vessels was not noted in any of the patients.

Some of the cases seemed almost incredible. For instance, a Boer prisoner was brought in from the trenches on Pieter's Hill. A Lee-Metford bullet had entered the chest over the centre of the cardiac region, had passed horizontally backwards and escaped about two inches to the left of the spine. There were intense dyspnœa and lividity of the face for thirty-six hours. These symptoms then rapidly subsided and on the sixth day, when the patient was transferred to Pietermaritzburg, he seemed practically convalescent. From the position of the entrance wound and the course of the bullet in this case it seemed almost a physical

impossibility that the heart and pericardium could have escaped injury. One undoubted case of perforation of the heart, which occurred during the campaign, has been quoted by Mr. Clinton Dent. The patient lived for eight or ten days. At the autopsy it was found that a Mauser bullet had perforated one of its cavities.

WOUNDS OF THE ABDOMEN.

These gave sixty-six admissions. In all the cases the abdominal cavity was penetrated and in a large majority perforated. Twelve of the cases proved rapidly fatal from shock. Hæmorrhage into the abdominal cavity to any marked extent occurred in only two of the cases, both of which were moribund when they reached the hospital. In the remaining cases hæmorrhage was either absent or too slight to be detected by physical examination. When the intestines were perforated, blood, usually in small amount, was passed as a rule per anum. Its absence from the motions, however, could not be taken as a proof that the intestines had escaped injury. In none of the cases was there any protrusion of viscera or any perceptible escape of fæces or flatus through the external wound. This was no doubt due to the very small aperture made by the Mauser bullet. Throughout the campaign these cases were, indeed, a source of constant surprise, and in one sense at least of considerable disappointment. The idea that a bullet could pass through the abdomen without inflicting fatal injuries on one or more of the viscera was opposed to all previous experience. Yet in the South African campaign recovery from perforating bullet wounds of the abdomen was by no means uncommon under simple expectant treatment. At the commencement of the war a very general hope was felt that operative surgery would have come to the relief of some, if not many, of these cases. The general experience of the campaign, however, has shown that laparotomy is only applicable under rare and special circumstances in the field. As the operation was not performed for gunshot wound in my field hospital I speak on the subject with very great diffidence. I may, perhaps, however, mention the impressions which our cases have left on my mind. If a bullet passes through the epigastric or umbilical regions and there are symptoms which justify a diagnosis of perforation of the stomach or small intestines, an operation is urgently called for, provided always that the patient can be at once placed in a stationary hospital. If six or eight hours have elapsed since the receipt of the wound, as must happen in most pitched battles,

laparotomy would, I believe, be more likely to hasten the patient's end than to relieve him. In wounds involving the splenic region, with symptoms of steadily increasing internal hæmorrhage, immediate laparotomy would probably give the only possible hope of recovery. In those of the hypogastric region, which involve the bladder, the decision will depend on the conditions present in each case. If the exit wound is of sufficient size and so situated as to allow free discharge of urine, the wound should be allowed to heal by granulation. When, however, owing to the direction of the wound or to some other accidental condition, urine is gradually accumulating in the peritoneal cavity, the patient cannot escape without an operation.

On the other hand, in bullet wounds of the outer abdominal regions which involve the ascending or descending colon, the liver, or the kidneys, laparotomy is not usually called for, as many, if not most, of these cases do well under expectant treatment.

In arriving at a decision in any given case, however, we must be guided quite as much, if not more, by existing circumstances as by the patient's condition or by the character of his wound. It would be worse than useless to perform a difficult and delicate abdominal operation on a patient who, perhaps immediately afterwards, might have to be moved a considerable distance, in all probability over rough ground. For this reason I feel that it can rarely be justifiable to perform laparotomy in field hospitals attached to brigades at the front, as these units must be ready at any moment to move with their respective brigades. In future campaigns it will probably be found that abdominal section is only available when a man is wounded in the vicinity of a stationary or general hospital, to which he can be at once admitted. In actual warfare such cases are rare, except, perhaps, in attacks on fortified positions or during siege operations.

WOUNDS OF THE BACK AND SPINE.

Under this head there were sixty admissions. The great majority of the cases were simple flesh wounds of the back caused by glancing bullets, which passed more or less deeply through the soft parts. In about 20 per cent. of the cases the spine was more or less involved, and in quite half that number there was complete paraplegia. None of the cases presented any special features.

WOUNDS OF THE UPPER EXTREMITY.

These gave 288, or 25·3 per cent., of the admissions. A large majority of the cases were simple flesh wounds caused by Mauser

bullets. In ten of the cases the humerus was fractured, and in eight either or both the ulna and radius. In many of the fracture cases, and especially in those of the humerus, there was extensive shattering of the bone. In forty-seven cases the shoulder is specified as the part involved. A constant watch was kept for injuries of this joint which might be suitable for resection, but not a single instance of the kind was seen. Indeed, as far as I can recollect, the head of the humerus was not shattered in a single one of our cases. The elbow is mentioned as the part involved in only eight cases. In one of these a large fragment of shell struck the back of the joint, smashing the bones and causing such extensive injury to the soft parts that amputation had to be performed through the middle third of the humerus.

WOUNDS OF THE LOWER EXTREMITY.

These gave 492, or 43·2 per cent. of the admissions. As might perhaps have been expected, wounds of the lower were, as a whole, much more severe than those of the upper extremity. The femur was fractured in 24 cases and the tibia in 8. In 2 cases both tibia and fibula were fractured by bullets which passed transversely across the limb. In fractures of the femur the upper, middle and lower thirds of the bone were involved in about equal proportions. In not one of the cases is the head of the bone stated to have been shattered. This is curious, as wounds of the upper part of the groin were exceptionally common. The knee was involved in 21 cases. In few, if any, of these was comminution of the articular ends of the bone noted. Indeed, in many of the knee cases the bullet seemed to pass through the joint without causing any appreciable injury to either the bones or the articular cartilages.

TREATMENT.

As the cases reached the field hospital they were examined as quickly as possible. In simple flesh wounds, when the first field dressings were clean and undisturbed they were not interfered with. If, however, they were stained with blood or otherwise soiled they were removed and the wounds were washed with perchloride solution 1 in 1,000. They were then dusted with iodoform covered with a thick layer of boric, salicylic or salalembroth wool and firmly bandaged. Bullets which had lodged, if easily detected, were at once removed. When deeply embedded they were left for future removal. Considering the high velocity of the Mauser bullet it was surprising how frequently lodgment occurred, owing

no doubt to the very long ranges at which most of the firing took place.

As a rule hæmorrhage was conspicuous by its absence, but now and then it was found necessary to ligature an artery.

Fractures were carefully put up, many of them in extemporised wooden or zinc splints. In this connection I may, perhaps, mention that the Liston's long splint of the field panniers was found much too short and too narrow in most of the cases.

As regards operations, the rule adopted was not to perform any major operation unless it was absolutely necessary for the immediate safety of the patient. By adopting this rule many limbs were saved where at first sight such a result seemed almost impossible. Only four major and four minor amputations were performed. The other operations included: trephining 3, laparotomy 3, enucleation of eye 2, &c.

The cases of laparotomy were done, one for suppurative appendicitis, one for abscess of the liver and one exploratory, in a case which proved to be malignant disease of the liver.

In some of the gunshot wounds of the lung with hæmorrhage ergotinin was given hypodermically with apparent benefit.

Morphia was given freely by hypodermic injection. Every wounded man who had anything more than trifling pain had at least one injection. In the severer cases many had several and with apparently the best results. Indeed, I look upon morphia as more or less a necessity in severe and painful gunshot wounds. It relieves pain, diminishes the risks of shock and has, I believe, a beneficial action on the wounds.

In the abdominal cases it was given fully and was the main item in the treatment.

After the attack on "Hart's Hill" by the Inniskilling Fusiliers an unusual complication was seen in some cases. The hill was so swept by fire that it was impossible to collect some of the men for twenty-four hours or more. In some of these cases maggots had developed in the wounds. A little calomel dusted into the wound at once killed these and prevented any bad effects from their presence.

CONCLUSION.

A point of interest and importance is that amongst this large number of wounds, many of them very severe, many caused by shell and therefore much lacerated and oftentimes fouled by earth and other septic matter, no case of tetanus or of septic disease

occurred. When we consider that during the Crimean War 3 out of every 5 deaths after operation were due to septicæmia these results are distinctly gratifying.

They were due in a great measure to the skill and care of Captains E. M. Pilcher, D.S.O., and R. H. S. Fuhr, D.S.O., through whose hands a majority of the wounded passed.

Most of the fatal cases were mortally wounded and died shortly after reaching the hospital. Indeed, several of them were actually dead when they reached it, but as they had left the field alive they were accounted for in the hospital returns. Under the circumstances a death rate of 3·3 per cent. does not seem large.

THE MEDICAL SERVICES IN THE RUSSIAN ARMY.
(WAR.)

By LIEUT.-COL. J. HICKMAN.
Royal Army Medical Corps (Ret. Pay).

ON taking the field, the medical service performs its duties under the immediate authority of a general officer of the headquarter staff. It has already been noticed that this dual control exists in peace time; in war the conditions are further complicated by the addition to the medical administration of the Chief of the Army Service Corps. The Inspector General of Hospitals, in consultation with the Director-General of the Medical Services, and with the Chief of the Army Service Corps, elaborates the plan of necessary medical arrangements. The General Officer studies the plan, rejects or modifies it, and gives the orders to the three above-mentioned officers. The Inspector-General of Hospitals is usually a General Officer; a junior officer of administrative capacity and of scientific reputation, may, however, be chosen. He supervises the medical officers appointed to the different hospitals, all the *personnel* of the medical administration, and in general arranges all the details of working and equipment. He orders the movements of the field hospitals and bearer companies, and according to the course of events regulates the evacuation of the field hospitals, and is responsible for the transport of the sick and wounded. The dressing stations are inspected by him, and he is specially charged with availing himself of any local resources in supplies or transport.

His powers are in theory great, and resemble those allotted a Principal Medical Officer in our own Regulations. His duties, however, are mostly confined to the hospitals directly behind the actual fighting zone. In that zone, the Divisional Generals are supreme, and give orders directly to their Senior Medical Officers, without reference to any higher authority. On the lines of communication the Medical Officer is simply an adviser on professional matters, the military commandant at each post and a steward arrange the other details.

The Principal Medical Officer in the field is chief of the medical service; he has a certain authority on the *personnel*; a reserve of Medical Officers is provided to fill up any vacant posts. He arranges for the supplies of medicines and advises on sanitary matters, and represents where hospitals and convalescent depôts are

required. He also makes free use of any resources put at his disposal by the Red Cross and other Societies. As previously insisted on his rôle is purely technical.

In the Army Corps, the Medical Officer fulfils much the same duties as those first enumerated. In point of administration, the most important post is that of the Medical Officer of a division. A division is the tactical unit which serves as a base for the organisation of the medical service. In the Russian Medical Service no arrangements for greater numbers are contemplated; the regimental units are provided with separate establishments.

A division of infantry is accompanied by a bearer company¹ and a field hospital of 200 beds. Only half the field hospital is provided with transport, the other half is retained in store, and is used as a reserve of material. Except those in reserve and two small mobile hospitals, all the other medical units are placed under the orders of the Senior Medical Officer of the division. This officer has also under his orders an Assistant Surgeon, who is the chief of the bearer company; a regimental officer is appointed to command the stretcher-bearers and to administer the discipline, &c., of the bearer company. In an engagement, the Senior Medical Officer selects the places for dressing stations and field hospitals, and sees that his arrangements are carried out.

Organisation in the Fighting Line.—This service is completed by the regimental surgeons, having at their disposal a bearer company, and by the divisional bearer company and two field hospitals.

Medical Arrangements in a Regimental Unit—Four Battalions.—From what one has seen of the organisation in time of peace, it is apparent that service in the field cannot make many modifications. In fact the regimental unit possesses sufficient resources to establish dressing stations, to transfer the sick and wounded, and to start a temporary hospital. The senior surgeon has at his disposal four surgeons, twenty-two feldschers, thirteen hospital attendants, four pharmacy waggons, four ambulance waggons, each carrying four lying down cases and one seated, and thirty-two stretchers. He can thus carry twenty wounded; the temporary hospital can

¹ Bearer Company in French is "Ambulance," in German "Das Feldlazaret," in Russian "Brizadni Lazarek." In the A.M.D. Reports, and in the Medical Organisations of Foreign Armies, "Ambulance" is translated "Ambulance Wagon." The divisional hospital means the field hospital of the division and not the bearer company.

accommodate sixteen usually, or during an engagement thirty-two. In his waggons eighty rations are stored to ensure, for the time, the feeding of the wounded.

The regiments of cavalry and artillery are provided with a proportional medical staff, &c. The medical store waggons are part of the regimental transport, and follow their units almost into the fighting line; they contain dressings, &c.

Each soldier is provided with a first dressing, the feldschers have each a small haversack, and the surgeons a surgical haversack and some compressed drugs. At an engagement a dressing station is installed. The stretcher-bearers leave their battalions under the control of one non-commissioned officer from each battalion and form a unit, commanded by one regimental officer. They deposit their arms at the place where the waggons have stopped, they are then fitted with small haversacks and advance with the stretchers into the fighting line. They pick up any wounded, and bring them back to the dressing station.¹

PERSONNEL AND MATÉRIEL OF UNITS AT THE FRONT.

	Regiment of Infantry, 4 Battalions	Regiment of Cavalry, 6 Squadrons	Brigade of Artillery, 6 to 8 Guns	Division Hospital	Field Hospital	Medical Convoy
Officers	—	—	—	2	1	1
Medical officers	5	2	2	5	4	2
Feldschers	22	6	7	5	9	4
Hospital attendants	7	—	1	22	65	19
Stretcher bearers	128	24	36	217	—	—
General duty men	—	—	—	40	38	73
Stretchers	82	6	12	50	40	—
Tents (twenty men)	—	—	—	4	3	1
Waggons (Ambulances	4	2	3	8	—	27
Pharmacy	4	1	2	3	4	1
Administrative	1	1	1	18	25	8
Horses	—	—	—	82	67	137
Rations for wounded	80	30	30	200	200	384

Organisation of a Division.—This is divided into two sections, one composed of a bearer company and a field hospital, which

¹ In the South African war, the colonial contingents and some of the British cavalry regiments had independent transport, their ambulances carried their wounded back to the nearest bearer company or to the field hospital. So in the Russian Army, the regimental ambulances work in the same way with the medical transport. When a brigade advances rapidly, or the front extends for miles, the bearer company may not be seen for days. Regimental light ambulances, any way one to each unit, are an absolute necessity.

follows immediately the column in advance; the other similarly follows the rear columns. The mobilisation of these medical units is arranged by the General (of Hospitals) and by the Principal Medical Officer. The *personnel* is selected partly by the medical and partly by the regimental authorities. The equipment, which is supposed to be complete in time of peace, is distributed amongst the regiments and various depôts. To each divisional bearer company is attached a company of 200 *stretcher bearers* and seventeen non-commissioned officers, all placed under the command of an officer. This company is only formed in time of war, and is composed of orderlies, stretcher bearers and musicians, taken from the reserve. The bearer company has four tents, eight ambulance waggons and fifty stretchers, it can thus transport forty wounded and provision temporarily 200. It will be noticed that this bearer company functions also, to a certain degree, as a field hospital. When the bearer company arrives at the fighting line the Senior Medical Officer takes over the direction, he establishes a dressing station on a large scale and sends out his stretcher-bearers to search for the wounded. As before stated, the regimental dressing stations are relieved of their wounded, and in all arms of the service the divisional bearer companies either do this, or reinforce the bearer companies already in the field. The principal dressing stations are organised by the divisional surgeon. If, however, great numbers of troops are actually fighting, the Inspector-in-Chief takes command and decides the situations for establishing the dressing stations and the field hospitals. These stations are generally about a mile behind the troops and at equal distances one from the other. The wounded are divided into two classes. The slightly wounded are dressed, &c., and then sent back to rejoin their corps. Those wounded who require an operation, or who require special care, are treated as quickly as possible and then sent back to the field hospital. Then, if not able to rejoin, they are transported to the base. Everywhere the surgeons simply exercise their profession, they are restricted to purely surgical work.

Divisional Field Hospitals are established in the vicinity of the bearer company in accordance with the orders of the senior surgeons of the division; the most sheltered places available are chosen. Their function is to take over the patients brought back by the bearer company, but at the same time they must be ready to evacuate their sick and to rejoin the column on the march. Each of the two hospitals can be broken up. Four sisters of

charity are included in their total, and are carried about in the only vehicle for the transport of wounded that this hospital possesses. It is rather curious that though these hospitals included twenty-nine waggons, not one is reserved for the transport of wounded. This transport is confided to convoys, instead of a system linked with the field hospitals; it is more or less detached and cannot work well.

These convoys are placed under the command of the Inspector-General. In their twenty-seven ambulances they can transport 200 wounded, sixty lying down; a kitchen on wheels is also added, which provides, at all events, proper food for the *personnel* of the sick. These convoys are in touch with the troops, and with the transport obtained from local sources can evacuate all the unfit from the fighting zone.

Organisation in the Second Line.—The Inspector-General of hospitals is here the director of all the means of lodging and transferring the sick and wounded, and finally the bringing of them to the lines of communications. Independently of the sick convoys, he has at his disposal two field hospitals and four reserve hospitals for each division of infantry and any other hospitals organised in the zone of operations. These field hospitals can replace the others or supply any article deficient or used up on service. The hospitals in reserve have a *personnel* and equipment analogous to field hospitals, but they have no waggons, no saddlery, and no drivers. They are simply a collection of material, &c., interchangeable on demand, or on requisition of the necessary transport they can become available at any point where required. They are commanded by a combatant officer, with the aid of a medical officer and a steward. The Inspector-General can utilise them to the best advantage; they can be added to by the erection of auxiliary hospitals and depôts for convalescents. These latter are erected in the vicinity of the hospital and are under the same medical charge and under the same military command.

Evacuations of Sick and Wounded.—There are three zones recognised, the one of the fighting line, an intermediate one, and the base. In each zone a committee sits; it is composed of a colonel as president, and of five members, amongst which a medical officer and a delegate of the Red Cross Society are included. The Commission utilise all means of transport. In each zone a central station where the unfit are gathered together is instituted; they are then divided into classes, some to be treated locally and others to be sent back to the zone immediately behind.

Hospital Trains.—As regards railway arrangements for the transport of sick and wounded, each train is fitted up for the conveyance of 250 to 400 patients. An enormous equipment ready to improvise invalid carriages is kept in store. Each train is commanded by a combatant officer, one medical officer, two feldschers, eighteen hospital attendants, six sisters of mercy, and ten fatigue men.

The Distribution of the Sick and Wounded.—In 1859, after the war in Italy, Austria found it necessary to take special measures to evacuate the hospitals near the theatre of war. Nearly 50,000 patients were sent back and distributed amongst the military and civil hospitals, and amongst the civil population. In Russia this lodging of the patients in private houses is part of the system. On commencing hostilities, a list of inhabitants is asked for who are ready to receive into their houses sick or slightly wounded cases, where convalescence would not demand a very elaborate nursing or care. A bonus is given for the support of such patients, and the authorities are ordered to prepare a list of those who will undertake to assist with their hospitality the victims of devotion to the country.

Red Cross Society.—After Sadowa, Russia joined the Geneva Convention and the Central Society was founded and placed under patronage of the Empress. This Association became soon a great national institution; it is splendidly endowed, and in its sphere are included the organisation of charities and work undertaken in England by the St. John Ambulance Association. Its official rôle is to assist the medical services of the Army, and to distribute to the sick articles of diet or equipment which are not provided by the military administration. It is possible to give an idea of the extent of its functions by stating its normal establishment. This consists of twenty-five hospitals, thirty-seven bearer detachments, seven convalescent homes, four orphanages for military children. It numbers in its ranks and provides for 3,600 sisters of charity. This is, however, not all. In 1888 the Convention founded, under the auspices of Alexander III., a school of medicine for women, who are trained as assistant surgeons. This school is an annexe of the Hospital of the Dames of the Red Cross at St. Petersburg. The young ladies who enter follow the curriculum for four years, they then are granted a diploma, which confers on them the right to practise medicine throughout the Empire. The Red Cross also organises the recruiting and the distribution of the sisters of charity, who are employed in the military hospitals, and those who proceed

on duty with the army in the field. Independently of the *matériel* that the Society issues for the use of the troops, it also aids in the service of evacuating the hospitals at the front; that is, by affording additional transport and by the lending of a *personnel* skilled in this special branch. Its resources are numerous; the Government allotted to it the proceeds of special taxes during the war against China. It is estimated that since its foundation it has spent nearly £10,000,000. In the China war, a special hospital of 275 beds, and a hospital ship "Tsaritsa" were established at Port Arthur; in addition, fourteen bearer detachments were organised, and numerous posts for giving refreshments, &c., to the troops on the march were maintained. Five dépôts of clothing and medical stores were also created. In time of war its committee work in the different zones, and its members are included in the staff of the army, and are an important element in all questions relating to the sick and wounded. It is apparent that this Society is a powerful factor in the medical arrangements. The danger of all such extraneous aid is, that defects are permitted in the medical service under the impression that any failing will be remedied, or any necessary equipment supplied, by a powerful and rich civil corporation.

What the Red Cross accomplished in 1900-1901 is almost nothing in comparison to the work now in operation. Money is flowing in from all sides, Count Orloff Drwydoff has given a million roubles. The old believers of Moscow have sent 28,000 roubles. The Club at Moscow to which nobility alone are admitted, has sent 25,000 roubles to General Kuropatkin for comforts and necessities for the field hospitals, and 25,000 for the support of the families of the wounded. The French Colony has collected 10,000 roubles. The Red Cross confidently anticipate to transport and efficiently nurse 10,000 sick and wounded.

At St. Petersburg the departure of a Red Cross train is a daily occurrence.

The sisters of charity belong to all classes of Society, and they are of all ages from old ladies to young girls; they are all clad in nurses' uniform, a white shawl over the head and a thick grey hood over the shoulders.

Hospital Ships.—As the Russian fleet is effectually blockaded, these need not be mentioned. French ladies collected enormous subscriptions to organise a floating hospital (*Hôpital des Dames de Paris*) and a large steamer was allotted for this purpose by the Russian Government.

Dogs.—A number of war dogs, trained to search for and bring

in the wounded, and to carry medicine and stimulants, are being sent out to the Russian army.

It will be seen that the Russian Medical Military Service is arranged on the same lines as those of the other European armies. The division of the administration into two branches must prove fatal. The military side not only consider the medical officer as subordinate, but deny him the smallest administrative capacity. After the war in the Balkans a commission reported that the medical arrangements had hopelessly failed through the maintenance of a system condemned by every other civilised power.

It is also known that the War Minister, General Kuropatkin, had decided to give to the medical services the necessary autonomy. At present the steps taken to carry out this reform are unknown, but it is evident that a Commander-in-Chief with such ideas will support the medical officers in discharging their duties in the only way possible to ensure efficiency.

NOTE ON LIFTING WOUNDED.

BY LIEUT.-COL. H. E. DEANE.

Royal Army Medical Corps.

I AM induced to write this note chiefly from experience gained at the recent Camp of Instruction for the Royal Army Medical Corps at Bulford, of which I had the privilege of being Commandant.

On resuming duty with the Corps after service in India I noticed that men undergoing a recruit's course in the hospital had vague ideas of moving a patient lying on a bed from his back to one side, and the reason was not far to seek.

(1) The preliminary training is carried out, necessarily and rightly, by means of healthy men acting as patients, but the men show a marked lack of appreciation of the necessity of looking on the acting patient as a possible real one. There is no doubt as to one reason for this, which is strikingly obvious in watching the drill for "lifting wounded"; the acting patients largely help themselves; and, indeed, I am not exaggerating when I say they more often than not do the chief part of the lifting themselves. I will illustrate my point about moving patients in bed from my observation.

How Not to Turn a Man in Bed.—I have put a healthy man on the bed and told the orderly to turn him on one side so as to fully expose the back. The orderly puts his hands on the shoulders and hips and the man turns over, but chiefly by his own efforts; it apparently looks nice enough. I have then told the acting patient to give no assistance whatever, but to lie as much like a log as he can and to act as though he were paralysed, and difficulties at once arise. The orderly puts his hands as before on the shoulders and hips and begins to pull; the only thing that happens is that the shoulder and arm are pulled forward, and the orderly then takes a grip of the clothes and proceeds to drag the man over on to his side in a way that might be very deleterious, and at the lowest estimate would be very uncomfortable, to a really sick man.

The orderly is taught to place his hands under the shoulder and hip, but fails to appreciate what that means. He puts one hand over the back part of the deltoid, if he does get as far back even as that, and the other somewhere about the great trochanter.

How to Turn a Man in Bed.—What he ought to do is to get both hands as near the spinal column as he can, one over the

scapula, and the other over the ilium, that is, near the centre of the weight to be moved; he then easily turns the weight of the body and the limbs go over with it, instead of dragging the weight of the body over by means of the limbs. Of course, this is a point which can be put right during the hospital training of the men, though there is always a difficulty in inculcating right methods when faulty ones have become more or less established.

All practice drills should be carried out on the supposition that the patient can give no assistance himself, and acting patients strictly prohibited from giving any. Such men are so in the habit of raising themselves to allow bearers to put their hands under them, that I found bearers under difficulties in knowing how to slip, or wriggle, or work their hands under a patient.

(2) It is obvious that advantage should accrue if two men could be got to do the work laid down for four, as efficiently and with no bad results due to over-work. As regards a Bearer Company this economy of men can be carried out with increased efficiency, and such a result is very desirable when the extent of a modern battlefield and the numbers of men engaged with possible wounded is remembered.

Four Men to Stretcher Unit Unnecessary.—I am informed by Medical Officers who served in the South African war that four men could never be sent out with a stretcher, but yet stretcher drill with four men is the mode most commonly practised on parades. This drill is absolutely wasteful of men, and opposed to the ordinary principles of lifting a weight. Two men can be taught to lift a man more comfortably to themselves and the patient, and I should always teach that first, and then, if thought desirable, a third man could easily cut in, but the drill with four men, however taught, I consider unnecessary, and with the existing drill as laid down in the Manual, might be abolished profitably.

The instructions in the Manual for lifting wounded with two bearers require complete alteration.

It is practically impossible for two men standing on the same side of a wounded man, as ordered in the Manual, to lift him.

I had men out to try it while in camp; no two men even nearly succeeded in doing it, and I abandoned the attempt, as it was attended by a danger of broken collar bones to the acting patients.

Two Men only Necessary for Stretcher Unit.—The method of lifting wounded by four men gives them no idea of how to lift wounded when there are only two bearers, and as on service four bearers are not available for each stretcher, the bearers are sent out

with no training in lifting a man with the maximum advantage to themselves and the patient. Accordingly I make my stretcher drill unit to consist of two bearers only, and they can be taught to lift a man of any weight likely to be found in the army, and as the possibility of it may, I know, be questioned, I may mention that I demonstrated the method at Bulford Camp to Col. Fenn, C.I.E., and Lieut.-Col. Coutts, when they visited the Camp, two small bugler boys lifting a man of $14\frac{1}{2}$ stones on to and off a stretcher.

The faults of the existing drill are radical, that is to say, the bearers are taught to lift a man in a way that no one with practical knowledge of the subject would think of lifting a weight, and a wounded man must be looked on in the light of so many solid stones weight, before his possible wounds are taken into account.

Now, no man would think of trying to lift a weight when kneeling on one knee.

I know the present drill with four men does not provide for the wounded man being raised higher than to rest on the knees of the bearers, but surely the fact that the bearers may necessarily be required to adopt a standing position when holding the patient must be considered; and I have demonstrated the impossibility of doing that if the interests of the wounded man are to be taken into account. Further, as ordinarily done, the supposed patient in the four-men drill, invariably does the greater part of the lifting himself, and then gets into a position in which he can reach round and put his arms round the neck of No. 4 bearer, in fact, doing what a wounded man would be unlikely to do.

I have had this drill done with no assistance being given by the acting patient, and difficulties arose at once, naturally; the men cannot lift a weight when on their knees, and cause jolting to the patient which does not take place when only two bearers are employed. The position in which No. 4 bearer is placed with regard to lifting is absolutely impossible, a man of Herculean strength could not work against such mechanical disadvantages as trying to lift a weight on one knee with one arm stretched across the weight, nor is there the smallest reason why he should be asked to try.

As I said before, I make my stretcher unit to consist of two men, and first of all I show each of them how to lift a weight.

How Not to Lift a Weight, and How to Lift a Weight.—If asked to lift a weight before he has been taught how, the man stoops down with his back bent and knees perhaps only slightly bent and his feet probably some distance from his object to

be lifted, and begins to lift by bending his arms. He finds he cannot lift the weight comfortably. This position is shown in fig. 1. I then teach him that to lift a weight he must get as close to it as possible, so as to bring the centre of gravity as near



FIG. 1



FIG. 2.

the centre of gravity of his body as possible. Then keep the feet firmly planted on the ground, separated at a distance about equal to the width of the shoulders, but each man soon finds his own most comfortable distance; then bend from the hips and

knees, keeping the back straight, till the hands can grasp the weight, then keeping the arms straight, straighten the hips and knees (see fig. 2). The back being rigid affords the greatest mechanical advantage to the lifting muscles, which are those of the loins and hips. The man finds the weight now is raised easily.

They then apply this to a supposed wounded man.

(a) *Two Bearers Lifting a Wounded Man.*—The bearers stand on opposite sides of the patient, one opposite the lower part of the chest, and the other opposite the hips, on the side of the wounded



FIG. 3.

lower limb. They then stoop, and in adjusting their hands under the patient they may be allowed to raise their heels, but before attempting to lift the patient, their feet must be flat on the ground. The bearer opposite the patient's chest passes his, say, *left* hand and forearm well beneath the scapula, as far as he can, his *right* hand and forearm under the ilium. The second bearer passes his *right* hand and forearm under the patient's ilium, and if possible, clasps the first bearer's right hand; he places his *left* hand and forearm under the patient's legs. The patient is then raised with ease, with no jolting, and his body is kept straight, and the weight is firmly supported and evenly distributed on the bearers' arms.

It must be particularly impressed on the bearers that their forearms must support the patient's pelvis and not be merely placed

beneath the upper part of the thighs, which allows the pelvis to drop and the straight line which it is desirable to maintain, becomes broken. In this way the patient can be carried a considerable distance, as I have demonstrated in the Camp of Instruction (see fig. 3).

(b) *Two Bearers Lifting a Wounded Man by Aid of Slings of Stretcher.*—Now suppose that a man is too heavy and bulky to be lifted in this way by two bearers, I then teach them to utilise the slings of the stretcher. The bearers pass one sling beneath the patient's head and neck, and then, each taking one end, and pulling alternately against each other, pass it by a zig-zag movement downwards till it is beneath the scapulæ. The second sling is passed under the small of the back, and in the same way is pulled down till it lies across the pelvis, not the upper part of the thighs. The slings should be of about equal length on each side of the patient.

The bearers then stand either at opposite sides, or both on the same side of the patient. In the rough sketch they stand on the same side for diagrammatic purposes, but it is practically more or less immaterial which they do. One bearer takes the upper sling, the second the lower. They bring the ends of each sling together over the front of the body, and give them a couple of twists, leaving a space between the sling and the body.

The bearer with the upper sling then passes his left hand and forearm beneath the sling, between it and the patient's body, and takes a firm grip of the loose ends of the slings, and supports the head with his right hand. According to the length of the bearers' forearm, the sling will rest either quite in the bend of the elbow, or on the forearm. Either way he gets tremendous purchase.

The second bearer passes his right hand and forearm in a similar manner beneath the lower sling, and places his left hand and forearm beneath the legs.

They both rise together, the patient being in this way kept perfectly straight, and carry the man head first or feet first on to the stretcher, according to circumstances (see fig. 4).

In teaching the men to perform these methods of lifting on parade I have asked them if it were easy or not; and they were unanimous that it was easier than the at present prescribed methods.

After the first instruction the men lifted the acting wounded on parade as one man, whereas according to the prescribed method they were tumbling all over each other.

(3) I wish to say a few words regarding the waggon drill. This can equally well be performed with two bearers, as I have demonstrated at the Camp of Instruction, and more easily than the present method with four men, and with no jolting to the patient, which is not the case at present.

Two Bearers Loading the Waggon.—The stretcher is placed close to the tail of the waggon, and the two bearers stand on opposite sides, stoop down in the correct manner for lifting a weight and grasp the poles with their hands at about the distance of their own shoulders, and then rise, keeping their arms perfectly straight.



FIG. 4.

They may then be able to lift the stretcher till the wheels rest on the floor of the waggon, then they only have to push it home. But if the patient is heavy and the bearers small men, they may not be able to do this.

In that case, they put the handles of the stretcher on the floor of the waggon as far as they will go, and one bearer then shifts his hands along his pole till he can grasp each pole handle and supports the stretcher, while the second bearer gets into the waggon and raises that end of the stretcher to allow of the wheels being placed on the floor of the waggon.

Unloading the waggon can be done equally well.

The radical principles of lifting weights are also at fault in the prescribed method of loading a waggon with four bearers as in lifting the patient himself. The men are instructed to grasp the poles with one hand at the centre and the other at the handle of the pole. I have tried this personally, and with my height, over 6 feet, I have no power to lift the weight, and a short man is handi-

capped still further. The hands in lifting a weight properly must not be further apart than about the width of the shoulders.

In practice the men immediately appreciated the difference, and the ease with which the work was done was apparent to any onlooker.

My attention was drawn by Colonel Donovan, C.B., at his inspection of the Camp Instruction, to one point connected with the prescribed way of loading waggons. When the bearers have grasped the handles of the poles, and raised the stretcher so as to place the wheels on the floor of the waggon, there is not enough room for their hands at the side of the waggon, and the grasp has to be shifted at the critical time, causing jolting of the stretcher. This is avoided by having the stretcher lifted on ordinary principles of lifting a weight, when the hands are entirely clear of the pole handles.

AN ALTERNATIVE SOLVENT FOR LEISHMAN'S STAIN.

BY LIEUT. F. TULLOCH.

Royal Army Medical Corps.

THE one obstacle in the path of universal applicability of Leishman's stain has hitherto been a certain difficulty in obtaining the solvent. At the present time the only perfect solvent is Merck's methyl alcohol. *Pro analysi*: Acetone free. This is expensive and difficult to obtain, even in London; and abroad more so. Dealers often supply an article, without doubt impure, though the adjectives on the label leave nothing to be desired. The use of an impure methyl alcohol results in unsatisfactory staining.

The following is the description of a simple method by which ordinary methylated spirit can be used to replace pure methyl alcohol, and which is the fortunate outcome of an experiment to that end. To 25 c.c. (7 fl. dr.) of methylated spirit add from a drop-bottle exactly two drops of a 10 per cent. solution of potassium bicarbonate. In this alkalisied spirit make a saturated solution of the stain, by grinding up in a pestle and mortar a little more of the powder than will ultimately dissolve. The excess of the powder will adhere to the sides of the vessel, and the fluid stain can be decanted into a stoppered bottle. If the stain is used immediately after it has been dissolved there may be a slight crystalline deposit on the finished preparation when seen under a high power, but after it has been kept for twenty-four hours this does not occur.

(In passing I may say that more than one writer on tropical medicine has described methylated spirit either as the usual, or as a feasible, solvent for this stain. It will, however, be found that Leishman's stain is very sparingly soluble in methylated spirit, unless the latter has been alkalisied. As might be expected the staining is, in consequence, feeble and not characteristic. There is also a copious crystalline deposit on the preparation, which effectually obscures the picture.)

The application of the stain when dissolved, as above described, differs slightly from the ordinary routine, and a separate fixation process becomes necessary because methylated spirit is not so rapid and perfect a fixing agent as methyl alcohol. The blood film is spread and dried rapidly by waving it in the air for a few seconds. It is then fixed for ten minutes in a mixture of methylated spirit and ether in equal proportions. At the end of ten minutes this is dried off and the film is ready for staining. As there is now no object in letting the undiluted stain act on the film it is at once diluted with twice its volume of distilled water in the ordinary way, or the diluted stain may be added

direct. An ordinary blood film is stained in five minutes. Chromatin staining is obtained in eight minutes. After staining the film is washed by dipping it into a vessel of distilled water, and moving it to and fro for about thirty seconds. It will be seen, even after this, to have a bluish tinge. It is next washed with dilute acetic acid ($\frac{1}{1500}$), and in a few seconds becomes a bright "eosin" pink. It is then rinsed in distilled water and dried by blotting. This decolourising process needs no special care. It takes about five seconds, and is simply continued until the film becomes pink. There is no danger of decolourising the chromatin, even in old blood films. Excellent fixation is obtained by the method above described, but, even without ether, fixation for fifteen minutes in spirit alone gives good results. The addition of water to nearly all samples of commercial methylated spirit causes a cloudy white precipitate. This reaction in no way affects the staining results. Absolute alcohol can be used instead of methylated spirit, in the same way and with identical results, as also the rectified spirit of the Pharmacopœia. The latter contains 10 per cent. of water, so that even if it be used as solvent, the mixture of methylated spirit and ether is preferable as the fixative. The results obtained by this method are exactly similar to those obtained by Leishman's original formula. I venture to hope that it will prove useful to officers abroad and will facilitate the application of Leishman's stain for blood examination.

In conclusion, while it is unlikely that methylated spirit should vary so much in any part of the world as to produce failure by this method, yet I should be very grateful if officers of the corps stationed abroad and using it in this way could find time to let me know their results.

NOTE BY MAJOR W. B. LEISHMAN, R.A.M.C.

The alternative solvent for this stain, which has been devised by Lieut. Tulloch, should prove of great service to those who are unable to obtain the proper quality of pure methyl alcohol. I have tested the staining solution prepared by him as described above, and find that the results are extremely clear and good, and little, if at all, inferior to those obtained when pure methyl alcohol is employed.

ERRATUM.—In the paper by Mr. Ernest E. Austen, on "The House-Fly and Certain Allied Species as Disseminators of Enteric Fever among Troops in the Field," which appeared in the June number, an error has unfortunately occurred, for which our printers are responsible. The figures on Plate I. were wrongly numbered. The figures on this plate should have been numbered 3, 1, 2, commencing from the top of the page.—ED.

ON SOME MAMMALS
COLLECTED [BY CAPT. H. N. DUNN, R.A.M.C., IN THE
SOUDAN.

By OLDFIELD THOMAS, F.R.S.

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THE National Museum owes to Capt. H. N. Dunn a collection of mammals, mostly small, made by him in the Egyptian Soudan in the course of 1902. Among these no less than five prove to need new names, thus showing how much still remains to be done in studying the mammals of this interesting region; and it is hoped that other officers will follow Capt. Dunn's example.

The localities at which collections were made are mostly rather to the southward of Khartoum, the majority of them being in Kordofan, a province hitherto almost entirely unrepresented in our collections.

Besides the earlier writings of Sundevall¹ and Heuglin² on the Mammals of this region, reference may be made to a paper by Mr. de Winton on a collection from Shendy,³ to the north of Khartoum, to the same author's work⁴ in conjunction with the late Dr. J. Anderson on the Mammals of Egypt generally, and to a small paper⁵ of my own on Mr. Hawker's collection from the Fashoda region of the Nile.

1. ROUSETTUS STRAMINEUS Geoff.
4. ♂. Khartoum. 15 August, 1902.
2. HIPPOSIDERUS CAFFER Sund.
65. ♂. El Obeid, Kordofan. 22 October, 1902.
- H. caffer* had already been recorded from this region by Temminck⁶
3. MEGADERMA FRONS Geoff.
9. Wad Medina, Blue Nile. 21 September, 1902.
4. TAPHOZOUS PERFORATUS Geoff.
- 1, 2, 3. ♂ ♀ ♀. Khartoum. 28 June, 1902.
5. CANIS ANTHUS SOUDANICUS, subsp. n.
60. ♀. El Obeid. 2 October, 1902. (B.M. No. 3.2.8.8.) *Type*.
119. Habessa Wells, W. Kordofan. 7 December, 1902.

¹ "Om Professor J. Hedenborgs insamlingar af Däggdjur i Nordöstra Africa," K. Vet.-Ak. Handl. 1842, p. 189.

² Reise N.O.-Afrika, ii. 1877.

³ Nov. Zool. viii., p. 397 (1901).

⁴ Anderson & de Winton, "Mamm. Egypt," 1902.

⁵ Ann. Mag. N. H. (7) viii. p. 273 (1901).

⁶ *Fide* Anderson, "Mamm. Egypt," p. 102.

The eastern representative of the Senegal *C. anthus* F. Cuv. Closely allied to the typical form, but paler and with markedly smaller teeth.

General characters as in true *C. anthus*. Colour rather paler, a clear sandy buff. Hairs of back and of tail broadly tipped with black. Skull, as may be gathered from the measurements below, smaller and more delicate.

Dimensions of the type :—

Head and body 650 mm.; tail 230; hind foot (s. u.) 137; ear 80.

Skull: basal length 136; zygomatic breadth 78; length of nasals (diagonally) 49; interorbital breadth 26; breadth across postorbital processes 37; breadth of brain-case 49.5; palate, length, 72.5; breadth between outer corners of p.⁴ 44.

Teeth: length of p.³ 9.6, of p.⁴ (on outer edge) 14.2, of m.¹ 11, of m.¹ and m.² combined 16.8; breadth of m.¹ 14, of m.² 10. (Below), length p.³ 8.7, of p.⁴ 10, of m.¹ 17.3, m.² 8.1.

Hab. and type as given above.

This is the Jackall figured by Cretzschmar¹ from Rüppell's specimen as *C. anthus*, but is clearly at least subspecifically different from that animal. Mr. de Winton has recently shown² that none of the earlier names of Hemprich and Ehrenberg or other authors apply to this form, and I therefore venture to bestow one on it.

6. *VULPES VULPES ÆGYPTIACA* Sonn.

40. ♀. Khartoum. 4 September, 1902.

7. *VULPES PALLIDA* Cretzschm.

8. ♂ (young). Wad Medina, Blue Nile. 18 September, 1902.

8. *ICTONYX FRENATA* Sund.

118. ♂. Gebel Haraza, W. Kordofan. 6 December, 1902.

The rediscovery of this species is of interest, as there has always been some doubt whether it was or was not the same as the more northern *I. lybica*. It proves to be readily distinguishable by its smaller size, by certain differences in its body pattern, and, especially, by the absence of the black ends to the caudal hairs.

9. *DIPODILLUS STIGMONYX* Heugl.

5. ♀. Khartoum. 19 August, 1902.

A topotype of the species. As already noted,³ the specimen in the Stuttgart Museum marked *Meriones stigmonyx* does not agree with Heuglin's description of this animal, and is more like that of his *M. dongolanus*.

It is to be observed that the present Gerbille and the next one are so extremely alike, that it is almost impossible to distinguish them apart except by an examination of the soles and skulls. There is, however,

¹ Atl. Rüpp. Reise Mamm. pl. 17 (1826).

² Anderson & de Winton, "Mamm. Egypt," p. 213 (1902).

³ Ann. Mag. N. H. (7) viii. p. 276 (1901).

a darker median area ("Scheitel und Rückenmitte satter gefärbt") in the *Dipodillus* not present in the *Gerbillus*, and this confirms my previous allocation of the name, which in any case having once been made should be adhered to.

10. *GERBILLUS AGAG*, sp. n.

96. ♂. Agageh Wells, W. Kordofan. 17 November, 1902. (B.M. No. 3.2.8.11.) *Type*.

A small species of true hairy-footed *Gerbillus*, with comparatively short tail.

Size small, and feet short. General colour above soft sandy buff, slightly lined on the back with the dark tips to the hairs, but without any marked darker dorsal area. Along the back the bases of the hairs are plumbeous, but laterally, still within the sandy area, the hairs are broadly ringed with white subterminally, though this colour does not show on the surface. Under surface pure sharply-defined white as usual. Cheeks, a prominent patch above and behind each eye, and another behind the ear white. Whole of fore limb white, hind limb with a sandy line down its outer side, the inner side and whole of feet snowy white; palms and soles thickly hairy. Tail short for this group, pale sandy above, darkening towards the pencilled end; white below.

Skull unfortunately broken in the single specimen. Molars markedly smaller and lighter than in the common Soudanese *G. pygargus*.

Dimensions of the type:—

Head and body 87 mm.; tail 100; hind foot (s. u.) 24; ear 11.

Length of upper molar series 3·7.

Hab. and type as given above.

This little Gerbille is distinguished from its neighbour *G. pygargus* by its smaller size and shorter tail. Its close resemblance to *Dipodillus stigmomyx* has already been noted.

11. *ARVICANTHIS DUNNI*, sp. n.

103. ♂. Kaga Hills, W. Kordofan (about 120 miles W. of El Obeid). 20 November, 1902.

"Dug out of reddish sandy cultivation soil, from among the natives' crops of dukhan."—*H. N. D.*

A many-striped species of the *A. barbarus* group; allied to *A. zebra*, but smaller, paler, and with the light and dark stripes less contrasted.

Size small, the smallest of the group. General pale ground-colour buff, the lateral darker stripes brown instead of black. Head coarsely grizzled buffy and brown. Central dorsal stripe beginning on the crown, very narrow, blackish, but not so deep a black as in *A. zebra*; outside this there are on each side five uninterrupted buffy stripes, separated from each other by broad brown bands, each of which is divided down the centre into two by an interrupted band of light, an arrangement essentially as in the other species. The light spaces are throughout clear buff, and the dark lines brown, a clear buffy line passing along below the

outermost dark line and edging the pure white of the belly. In *A. zebra* the outer lines at least are white, only those near the spine being buffy. Eye-ring buffy. Ears dull ochraceous, without darker marking. Arms and legs pale buffy, becoming white on the fingers and toes. Tail well-haired; dull ochraceous above, with a narrow and inconspicuous mesial line of black; whitish below.

Skull conspicuously smaller than in *A. zebra* and the other species of the group, with rather larger bullæ; incisors narrower, but molars rather larger in proportion.

Dimensions of the type:—

Head and body 90 mm.; tail 70; hind foot (s. u.) 23; ear 14.

Skull—greatest length 28; basilar length 22; zygomatic breadth 13; nasals 10×3.4 ; interorbital breadth 4.4; breadth of brain-case 12; palate, length 12.2; diastema 6.7; palatal foramina 5.6; length of upper molar series 4.9.

Type. Old Male. B.M. No. 3.2.8.15. One specimen only.

A Fashoda striped rat presented by Mr. R. M. Hawker in 1901 being identified as *Arvicanthis zebra*, the present species may be readily distinguished from it by its much smaller size and more buffy coloration.

Capt. Dunn tells me that this rat was very common in the cultivated fields of the natives, burrowing in their crops of dukhan. It is a very handsome and distinct species, and I have much pleasure in connecting his name with it.

12. *ACOMYS WITHERBYI* de Wint.

73. ♂. Katul Hills. 30 October.

13. *LEGGADA TENELLA*, sp. n.

7. Old ♀. Roseres, Blue Nile. 14 September, 1902. (B. M. No. 3.2.8.13.) *Type.*

"Found in burrows in cornfield; had 7 young in the womb."—*H. N. D.*

A very small species of the *L. minutoides* group.

General colour of cheeks and sides a clear sandy or ochraceous buff, with a distinct darker median dorsal area, commencing as a narrow well-defined line on the nose, broadening on the crown, and extending, though less sharply defined, all down the back, and dying away on the rump. Under surface pure sharply-defined white. No lighter markings round eyes. Ears small, evenly rounded, grey, their edges faintly whiter; a large and prominent white patch behind and below their posterior bases. Fore limbs wholly white; hind limbs with a narrow line of the body-colour continued down on the hinder side to the heel, otherwise white. Tail about as long as the body without the head, brown above, inconspicuously lighter below.

Skull smaller and narrower than in the Cape *L. minutoides*, with square and well-defined supraorbital edges. Palatal foramina ending level with the anterior fourth of m.¹. Posterior palate elongated, its

hinder edge about equidistant from the last molars and the front of the bullæ.

Dimensions of the type:—

Head and body 50 mm.; tail 35; hind foot 11·5; ear 9.

Skull: greatest length 17·2; basilar length 14; zygomatic breadth 9; nasals, length 6·3; interorbital breadth 3; brain-case, breadth 7·5; palate, length 9·3; palatal foramina 4·0; diastema 5·0; length of upper molar series 3·0.

Hab. and *type* as given above.

This beautiful little species is readily characterised by its strong sandy colour, the marked dorsal darkening, and elongated palate.

14. *JACULUS GORDONI*, sp. n.

85. ♀. Gebel Agageh, W. Kordofan. 12 November, 1902.

104. 105. ♂♂. Kaga Hills, W. Kordofan. 20 November, 1902.

106. ♂. Gebel um Durragh, W. Kordofan. 25 November, 1902.

Allied to *J. jaculus* Linn., but larger and differently coloured, and with longer ears.

Size rather greater and build stouter than in *J. jaculus*. General colour above, as compared to the yellowish "buff" of *J. jaculus*, darker, and nearly approaching to "vinaceous buff" of Ridgway. Laterally, the dark colour seems to pass rather sooner into the pure white of the under surface. White markings more extended than in *J. jaculus*, the cheek, supraorbital, and postauricular white patches all large. White hip-stripe large, weakened in colour by a faint buffy or brownish sprinkling. Four limbs wholly white. Hinder aspect of thighs like back. Fine hairs of feet silvery white, the terminal half of the long digital hairs sandy. Tail of the usual pattern, its basal portion isabelline buffy above; black subterminal band rather over an inch in length; white tip $\frac{1}{2}$ – $\frac{3}{4}$ in.; longest hairs at end of tail 16–17 m.m. in length.

Skull shaped quite as in *J. jaculus*, but larger and heavier throughout.

Dimensions of the type, measured in the flesh:—

Head and body 120 mm.; tail 200; hind foot (s. u.) 63; ear 25.

Skull: greatest length in middle line 34; basilar length 27·5; zygomatic breadth 24; tympanic breadth 24·7; length of nasals on outer edge 12·5; interorbital breadth 12·8; interparietal 5·7 × 8·7; palate, length 17·3; palatal foramina 4·7; diastema 9·6; length of upper molar series 5·1.

Hab. (of type). Kaga Hills, W. Kordofan. Also occurring at Omdurman.

Type. Old male. B. M. No. 3.2.8.16. Original number 104.

This Jerboa, which I have named in memory of the famous General Gordon, differs decidedly from the ordinary Egyptian *J. jaculus* by its larger size and different colour. The Museum had previously received a specimen of it from Omdurman, collected by Mr. W. L. S. Loat, but as that was young and without skull, it could not be described.

The only other species which need be referred to is *Dipus microtis*

Reichenow¹ from "Samar, in Nord-ostafrika." That was founded on a young specimen, but the description of its teeth shows that it was sufficiently adult not to be the young of the present form, than which it is very much smaller ("Laufänge 35 mm."), with shorter ears, and with the remarkable character (if not due to accident) of having no white at the end of its tail.

15. *LEPUS ÆTHIOPICUS* H. & E.

6. ♂. Shendy. 1 September, 1902.

92.93.94.97. ♂♂ ♀♀. Agageh, Kordofan. November, 1902.

39. ♂. Wad Medina, Blue Nile.

16. *PROCAVIA RUFICEPS* H. & E.

77. ♂. Kaga Hills, Kordofan. 2 November, 1902.

78.79.80.83.88. Agageh Hills. November.

17. *ORYX ALGAZEL DAMMAH* Cretzschm.

♂. Kordofan.

Practically a topotype of the subspecies.

When the "Book of Antelopes" was published, owing to the predilection of the senior author for "well-established" names, the term *leucoryx* was used for the species to which Lichtenstein erroneously transferred that name, while the true *leucoryx* of the Persian Gulf was called by Gray's name *beatriz*. To put matters more in accordance with modern ideas on nomenclature, the Scimitar Oryx should bear the name *algazel* Oken; but as that name was founded on Cuvier's figure of a Senegal specimen, and it is practically certain that the Eastern Soudanese form is at least subspecifically distinct from the Western, a second name is required, and this we find in the "*Antilope dammah*" of Rüppell and Cretzschmar. *A. dammah* was erroneously identified by Rüppell, and following him by Selater and myself, with the Beisa, but by its locality ("die grossen Steppen von Haraza") is clearly shown to be the Scimitar Oryx. This is fortunate, as the name *dammah*, being earlier than *beisa*, would have had to be used in the latter's place had Rüppell's identification been correct, but now the Beisa is left with its familiar name unaltered.

Briefly put, the nomenclature is as follows:—

Scimitar Oryx.

ORYX ALGAZEL Oken.

O. leucoryx of authors generally, not of Pallas.

Western form:—

Cemas algazel Oken, Lehrb. Nat. iii. pt. ii. p. 741 (1816); ex

L'Algazelle, F. Cuv. H. N. Mamm. i. pl. 376 (1819). (Senegal.)

Eastern Form:—

Antilope dammah Cretzschm. Alt. Rüpp. Reise, Mamm. p. 22 (footnote), 1826. (Haraza, Kordofan.)

White Oryx.

¹ Zool. Anz. x. p. 869 (1887).

ORYX LEUCORYX Pall.*Antilope leucoryx* Pall. Spic. Zool. xii. p. 17 (1777).*Oryx beatrix* Gray, P. Z. S. 1857, p. 157, and of authors generally.**18. GEZELLA RUFICOLLIS** H. & E.

♂. Gebel Tueis, 90 miles E. of Omdurman. 9 October, 1902.

This fine Gazelle is a most acceptable addition to the National Collection, in which the species is still badly represented.

19. GAZELLA RUFIFRONS Gray.

♂ ♀. Agageh Wells, Kordofan. November, 1902.

Capt. Dunn tells me that this Gazelle does not range beyond about 50 miles to the northward of El Obeid.



Clinical Notes.

ANEURYSM OF ABDOMINAL AORTA AND CÆLIAC AXIS; ATTEMPTED CURE BY POWER AND COLT'S WIRE APPARATUS. DEATH FROM DOUBLE PNEUMONIA.

BY MAJOR M. P. HOLT.

Royal Army Medical Corps.

CASES of the treatment of abdominal aneurysm by the introduction of wire within the sac have been reported from time to time, but the methods used have been crude, scarcely calculated to attain success, or to safeguard asepsis, and certainly not easy in manipulation. The apparatus designed by Messrs. D'Arcy Power and Colt, is calculated to fulfil every one of these conditions in suitable cases. A full description of the apparatus was given in their most interesting and epoch marking paper in the *Lancet* of September 19th, 1903, and also in the *Transactions of the Royal Medical and Chirurgical Society*, vol. lxxvii. Briefly, this most ingenious apparatus provides an expanding wire cage or wisp, folded within a "cartridge" of very small calibre, which is introduced into the aneurysm sac through a minute puncture made by a special canula and trocar; the whole apparatus, including a few accessory parts, is sterilisable by boiling. For further details reference must be made to the original papers, or to the "directions for use" which accompany the apparatus.

Sergt. R. was transferred to the Royal Infirmary, Dublin, on September 16th, 1903, from C. Station Hospital, complaining of increasing pain of several months' duration in the epigastrium, left costal margin, and left lumbar region, increased rather than diminished by vomiting. There was felt, with a little trouble, a small tumour to the left of the middle line, situated roughly midway between the xiphisternum and the umbilicus, of indistinct smooth rounded outline, about two and a half inches in diameter. The lower border was fairly well defined, the upper and right borders could not be made out, and the left only on very deep palpation, which caused pain. There was well-marked expansile pulsation, a loud harsh murmur, the latter faintly heard over both external iliac arteries. Later the size was nearly five inches in diameter, the other signs being but little changed. It is not proposed to relate in detail the entire clinical picture, or the gradual increase in the distress caused by the tumour. By December 3rd the pain had become so severe in the lumbar region that the patient was unable to rest in bed in any position, or to support the weight of the upper part of the body when sitting. Relief was only obtained by rigging up a sort of jury mast over

the bed and partially suspending him in this from the armpits. His condition became intolerable, he very rapidly lost flesh and colour, and without ceasing implored that "something" might be done at any cost. Under these circumstances there seemed to be no justification in delaying operation, and with the wiring apparatus above mentioned the risks appeared to be very small, provided only the aneurysm turned out to be a suitable one for the treatment. On December 8th, with this proviso in mind, ether was administered and the abdomen opened to the left of the middle line by Lennander's method; the first noticeable point was the intense congestion, particularly along the greater curvature of the stomach, then there was at once made out a large very tense tumour with very strong expansile pulsation lying behind the stomach. On turning up the great omentum, transverse colon and stomach, the tumour presented as it were a fundus or well-marked margin in front of the superior mesenteric artery, apparently distinct from the abdominal aorta, tracing upwards it extended 3 c.m. to the left, and barely 2 c.m. to the right of the aorta, and was then lost under the matted mass of pancreas, ascending transverse mesocolon, &c.; the left renal artery was apparently not implicated; on turning down the stomach, &c., further examination from above made out a sloping rounded surface, directed upwards and backwards from behind the lesser curvature, the lesser omentum was not adherent. Apparently the tumour was an aneurysm of either (1) the aorta involving also the coeliac axis, and probably sacculated, or (2) the coeliac axis only; further information could only have been obtained by making an extensive and dangerous dissection. It was decided to obtain access from above; the stomach was displaced downwards, the small omentum torn through and the aneurysmal wall exposed; it was now seen that the hepatic artery was pulseless; all the more noticeable since the pulsation in the tumour was terrific; the body and tail of the pancreas were found pushed forward; next the canula and trocar of Power and Colt's apparatus were pushed well into the sac, the trocar quickly withdrawn and at once replaced by a cartridge loaded with No. 1 size wire wisp; this latter was then slowly pushed through the canula into the interior of the sac by means of the piston; something less than half a drachm of blood being lost through the canula as the cartridge was quickly inserted. After a few moments the canula was withdrawn; there was no visible leaking at the site of puncture, but three Lembert sutures of catgut were inserted over the puncture and tied; a few seconds' observation sufficed to show that all was safely closed, then the tear in the small omentum was stitched with fine catgut, and the abdominal wound sutured by layers. There was no appearance of shock; evening temperature normal with an unusually (and undesirably) strong pulse. On the following morning the temperature was normal, and the patient comfortable; in the evening he became restless, complaining of pain in the chest on inspiration; pulse still very strong and full. On the

morning of December 10th he was constantly complaining of pain in the chest; respirations rapid, short and shallow; examination showed the existence of tubular breathing, with fine moist *râles* all over the left base; dulness to percussion over both bases; no cough, no pain in abdomen, no murmur now to be heard over either external iliac artery, and in the evening he was much worse, with still more rapid respiration (40); fine crepitations over both bases; cyanosed; temperature 103°; pulse 160; both bases dull to percussion; the cyanosis became more intense and respirations extremely rapid and shallow; unconsciousness followed, and he died during the night.

Post-mortem examination made twenty-four hours after death, permission having been obtained only to examine through the operation wound. Operation area clean, dry, and apparently aseptic, no blood or fluid in the peritoneum or signs of peritonitis; the aneurysmal tumour had shrunk to about one fourth of its original size; hepatic artery empty; portal and inferior mesenteric veins very full and tense; liver soft and flabby, and the spleen remarkably soft, flabby, and shrunken; the aneurysm, with the aorta from the diaphragmatic opening above to just below the origins of the renal arteries, was removed entire with the exception of a small area of about half an inch square of the posterior wall, where it was firmly incorporated with the anterior surface of the body of the first lumbar vertebra, which was bare and slightly eroded over a corresponding area; the pancreas was firmly adherent to the front of the aneurysm; other abdominal organs healthy; the lungs and heart were removed through an opening in the diaphragm; right lung nearly solid, infiltrated with pus, extending into the bronchioles; left lung patches of pneumonic consolidation spread over the lower lobe; the heart presented an enormously hypertrophied left ventricle, with large tough clots in the right auricle and right ventricle, otherwise normal; death due to double pneumonia. The aneurysm, much contracted in size, contained a considerable amount of firm clot, much of which was firmly adherent to the wire, the latter had expanded fairly well; when the specimen was cleaned it was seen to concern the abdominal aorta immediately above the celiac axis, the celiac axis itself, the origin of the superior mesenteric artery, and the aorta immediately below; the posterior wall of the sac was deficient where it had been detached from the body of the vertebra. Mr. D'Arcy Power kindly examined the specimen, and says: "It seems to me that there is no doubt of its sacculated nature. The wisp has expanded well after its introduction, and many of the strands of wire are covered more or less completely with blood clot. It is difficult to say how much of the clot was formed during life, and how much is *post-mortem*." Mr. Colt says: "It (the clot) is exceedingly adherent to the wire, and I think this is an argument in favour of the gilt wire."

It is a matter for extreme regret that the fatal result was due to

pneumonia of undoubtedly ether or "aspiration" origin; no opportunity was afforded of watching the later effects of the wire within the aneurysmal sac, though the immediate results were as satisfactory as could be desired. The operation itself demonstrated (1) the extreme simplicity of the working of the apparatus; (2) the complete safeguarding of asepsis; (3) the rapidity and accuracy with which a very large surface of wire, precisely determined beforehand, can be introduced through a pinhole opening; (4) the complete absence of hæmorrhage from the sac during and after the introduction, notwithstanding an inordinately high blood tension; (5) the complete avoidance of shock.

The operation was one of no little interest, and completely justified every point claimed for the apparatus by Messrs. Power and Colt; it was the first occasion on which it had been used, and so far as is known, the only case up to the present time; whether the actual aneurysm for which it was used on this occasion was of the most favourable type for the introduction of wire, judged by the light of complete *post-mortem* examination, might be open to some difference of opinion, but so far as could be determined at the time of operation without quite unjustifiable dissection, coupled with the extreme severity and progressive nature of the symptoms, there was no doubt in the minds of those present as to the propriety of the procedure, and it is impossible to speak in any but enthusiastic terms of the perfection of the actual mechanism of the entire apparatus.

A CORRECTION.

In a case of innominate aneurysm reported in the Journal for February, 1904, I drew attention to a case published by Mr. Ballance some time previously. Mr. Ballance has very kindly drawn my attention to the fact that in his case "the common carotid was distended where exposed for ligature, with clot at the time of operation."—*Lancet*, January 11, 1902, p. 1180.

NOTE ON A CASE OF CEREBELLAR ABSCESS. OPERATION; RECOVERY.

By BT. LIEUT.-COL. S. HICKSON.
Royal Army Medical Corps.

CHRONIC middle ear disease requiring operative interference is not uncommonly met with in the soldier; four such cases during the present year have been treated in the Royal Herbert Hospital by the performance of the complete mastoid operation. In the subject of this note a long-standing otitis media resulted in the formation of a cerebellar abscess, and the case is of special interest from the fact that although nearly all

the recognised symptoms of cerebral abscess were present, those peculiar to lesions of the cerebellum were almost entirely wanting.

The patient, Pte. C., 4th Royal Fusiliers, aged 20, a fairly well developed, though somewhat dull-looking lad, was admitted to hospital on February 5th, 1904, and the following notes have been extracted from his medical case sheet :—

“February 6th.—He did not give any clear history, and seemed rather drowsy. Stated that his illness began about one week before admission with pain in the left ear followed by a discharge; he had a very severe headache and had vomited twice before admission. His bowels had not been moved for two days. Had not had any shivering fit. About eleven years ago had an abscess at the back of this ear, but had no discharge from the ear that he remembered until a week ago.” (The above comprises all the information he was able to give on admission, but some days after the second operation he stated that he had fallen down on two occasions on parade, some days before he reported sick; he did not remember to which side he had fallen, said “he just felt giddy.” He had apparently forgotten having ever fallen when questioned the day after admission).

“*Present condition.*—Is very quiet, almost drowsy, mental activity seems dulled, has an expression of severe pain, does not seem to notice his surroundings, complains of severe headache, and great pain at back of neck. Speech apparently unaltered and cerebation not delayed. No tendency to fall to either side, reflexes normal, hand grips equal, no incoördination, no paralysis of ocular or other muscles, no conjugate deviation. Pupils equal, moderately dilated, react briskly to light and accommodation. No optic neuritis. Pulse 56, full sustained beat. Temperature 98°. Tongue foul. Examination of chest, abdomen, and urine negative.

“*Local condition.*—There is a small quantity of pus in the left external auditory meatus, and on clearing this out some pus and what seemed like cholesteatoma was seen. There is a large perforation in the anterior part of the membrana tympani. The membrane itself does not seem inflamed. Behind the auricle is a small scar about half an inch in diameter, it is about one inch behind, and quarter of an inch above, the external auditory meatus. There is no tenderness on superficial or deep pressure, and no œdema or redness behind the ear, and no redness along the course of the internal jugular.”

The condition remained unchanged until February 7th, when this note was made. “He is much more restless and cries out more, complains greatly of head and back of neck, especially on left side. There are no further physical signs, calomel gr. ii. yesterday, bowels moved twice.”

Next day, February 8th, the following note appears: “Still in same condition, but slight increase of restlessness, is semi-conscious, no localising signs of any description, no optic neuritis. Vomited twice during the night, bowels not opened. Temperature 98°. Pulse 54-60.”

Next day, February 9th, in view of the persistent headache, vomiting, and drowsiness, it was decided to open the mastoid antrum and if necessary explore the brain. Chloroform was administered by Lieut. Lambert, R.A.M.C. The usual incision was made behind the ear and the auricle turned forward, when a sinus was seen leading into a much enlarged antrum. The outer wall of this cavity was removed with chisel and bone forceps, and the whole of the middle ear and expanded antrum were found filled with breaking down cholesteatomatous material having a very foul smell. The cavity was thoroughly scraped out, and it was then seen that the whole of the outer wall of the iter had been absorbed and the appearance of the parts was as if an exaggerated Stäcks operation had been performed. The facial nerve was exposed for nearly half an inch of its ascending portion, owing to absorption of the posterior wall of the aquaeductus Fallopii. The bone of the roof of the attic and tympanum appeared healthy, there was no opening in it. The lateral sinus or dura were not explored, but a small sinus was exposed deep in the petrous bone which from its situation was considered to be the superior petrosal sinus; the bleeding was easily controlled by packing. The whole cavity was painted with pure carbolic acid, syringed out and packed, a conchomental flap, after the method of Ballance was formed, and the post aurial incision closed. On the morning following the above operation the following note was made:—

“ February 10th.—Last night patient was very weak and restless, refused all nourishment, was semi-conscious and repeatedly called out about his head. Given $\frac{1}{4}$ grain morphine. Pulse 60. Temperature 98.8°. No further physical signs.

“ 7 p.m.—Vomited once this afternoon, has had nothing by the mouth: constipation still marked. Nutrient enemata every four hours. Calomel gr. iv.”

Next morning, February 11th, the condition was worse, he had vomited several times during the night. The temperature was subnormal, 97°, and pulse 64. It was decided to reopen the wound and explore the brain. Chloroform was given by Lieut. Lambert, and the incision behind the ear opened up, the ear turned forward, the packing removed and the cavity thoroughly cleaned with carbolic lotion. The roof of the attic and antrum was removed by chisel and bone forceps and the dura exposed; it appeared healthy and pulsated; the lateral sinus was then explored and found normal. At this stage some pus was seen welling up from the deepest part of the field of the operation, it was coming from the opening in the superior petrosal sinus, which had been exposed during the first operation. This opening was enlarged by the removal of bone from the posterior surface of the petrous bone, internal to the lateral sinus, and about half an ounce of thick, foul smelling pus, containing small sloughs was evacuated. A probe passed freely into a cavity apparently situated in the left lateral lobe of the cerebellum; the ten-

torium could be distinctly felt above, forming the roof of the cavity. The post aural incision was now extended backwards, and with a half inch trephine a circle of bone was removed below the base line, one and a half inches behind and one inch below the external auditory meatus. A probe inserted through the mastoid opening could be distinctly felt in the abscess cavity beneath the dura exposed by the trephine. The dura and a thin layer of the cortex were incised, and the abscess cavity was found to have been almost completely emptied from the front through the opening in the petrous bone. The dura beneath the trephine opening was closed with fine silk and this wound closed; a gauze drain was placed in the abscess cavity from the opening in the petrous bone, the bony cavity was packed and the ear replaced. During the next three days the following notes were made in the case sheet:—

“February 12.—Patient had a fairly good night, he slept well, and to-day his condition is improved. Temperature 98.4°. Pulse 80. He complains of being hungry. Wound dressed, packing taken out, cavity irrigated with boric lotion; only a very small amount of pus came from the abscess cavity.

“February 13.—A small drainage tube inserted in place of the gauze drain. Mastoid cavity repacked. Temperature 98.8°. Pulse 96.

“February 14.—Pulse slow, 62, drowsy. On dressing the trephine wound a good deal of sero-purulent discharge escaped; this had the same foul smell as the pus from the cerebellum and had apparently collected beneath the dura under the trephine opening. This wound was accordingly opened up to allow free drainage, and lightly packed with gauze, and fomentations applied four hourly.”

From this time onward he improved rapidly, a small hernia cerebri appeared at the site of trephining but was easily controlled by pressure. The drainage tube was removed from the mastoid opening on March 9th, and the track allowed to close. Constipation was marked till the end of February, when the bowels became regular. There was no occasion to skin graft the cavity in the mastoid, as it granulated over and was rapidly covered by epithelium. On April 4th the cavity was quite dry and clean and covered with healthy skin, and he was discharged on sick furlough, at the expiration of which he will probably return to duty.

Remarks.—The case is brought to notice on account of the following points of interest:

(1) The fact that he sought admission to hospital only one week before the date of operation, in spite of the chronicity of the mastoid disease as evidenced by the extensive absorption of bone by cholesteatoma.

(2) Although the abscess was situated in the cerebellum, nearly all the classical symptoms pointing to an abscess of the cerebrum were present; viz., intense headache passing into coma, subnormal temperature, slow pulse, vomiting, obstinate constipation. Optic neuritis was

however, absent, as was delayed cerebation, which Barker describes as of great diagnostic value.

(3) Save for the giddiness and falling on parade, he had none of the signs mentioned by Dr. Acland and Mr. Ballance in their paper on cerebellar abscess (*St. Thomas' Hospital Reports*, vol. xxiii.), or of the symptoms described by Professor MacEwen.

(4) The fact that the abscess was attempting to empty itself into the mastoid antrum along the line of the superior petrosal sinus.

(5) The return of drowsiness and slow pulse on the second day after the operation, and the final disappearance of these symptoms on the establishment of free drainage through the trephine opening. It is probable that the reappearance of the symptoms was due to insufficient drainage, and it would perhaps have been better in the first instance to have drained through the trephine opening as well as through the mastoid.

(6) The loss of memory was striking; after the operation he could remember nothing of his illness or of his stay in hospital previous to operation.

(7) The large extent of bone absorbed by cholesteatoma; the cavity in the mastoid easily admitted the thumb, and gave one the impression that a complete mastoidectomy had been previously performed, but the patient was quite positive that nothing had been done but the "opening of an abscess" eleven years before, at which time this operation had not been described.

I am greatly indebted to Lieut. W. F. Ellis, R.A.M.C., for his careful notes of this case.

A CASE OF SUBASTRAGALOID DISLOCATION (COMPOUND).

By CAPT. H. W. GRATTAN.

Royal Army Medical Corps.

S. W., a native labourer, was brought to the Cantonment Hospital, Dalhousie (Punjab) on the morning of July 10th, 1903. Two days previously he had fallen down the khud (cliff). His condition was as follows: The left foot was wrapped up in several foul-smelling cloths, on the removal of which it was evident that patient had sustained a compound subastragaloid dislocation of the internal variety. The foot was in a position of extreme inversion, the sole looking directly inwards. The head of the astragalus was projecting externally—being button-holed by the skin. A foul stench came from the wound, which was of a dirty moist greenish appearance. The dorsum of the foot was much swollen. The relation of the astragalus to the ankle joint was unaltered. The tibia and fibula were intact. Patient had an expression of extreme suffering. Temperature 100°. Pulse 120. Respirations 20 per minute.

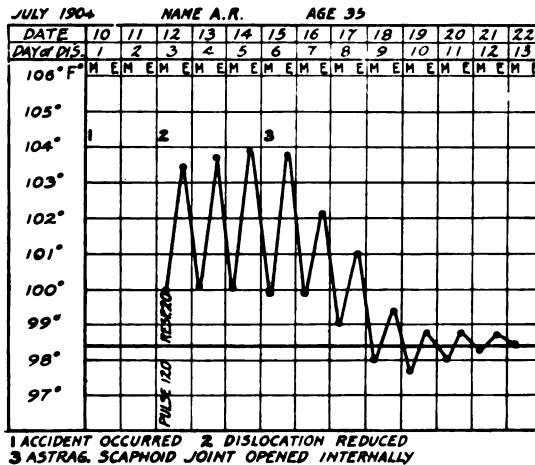


To illustrate Capt. H. W. GRATTAN'S Case of Subastragaloid Dislocation.



When he was asked why he had not come to hospital earlier, he replied that he had been trying "native remedies." But, on finding that fomentations of cow dung, &c. (prescribed by the local fakir) brought little relief—came to the hospital. Patient was anæsthetised and the wound thoroughly irrigated with 2 per cent. lysol solution.

It was found necessary to enlarge the wound in two directions before the dislocation could be reduced. A cyanide gauze dressing was applied and the limb raised and supported on pillows. Patient had a good night. The following morning the foot, ankle and calf were very much swollen, the left calf measured $\frac{3}{4}$ inch more in circumference than its fellow. The left femoral glands were much inflamed. Patient was informed that



amputation might be necessary in order to save his life. During the next two days his condition became even worse. After a consultation with Captain Crawford, R.A.M.C., it was decided to make a counter-opening into the astragalo-scaphoid joint internally and to enlarge the original external wound and scrape away any unhealthy tissue. After these measures had been carried out, the limb was placed in a lysol bath during the day and enveloped in a massive cyanide dressing at night. A water-proof sheet, supported at the sides, made a very excellent bath. From this date (July 15th) improvement was noticeable. The bath was discontinued fifteen days later.

On October 14th (the date on which I last saw patient), his condition was as follows: A shallow healing ulcer $\frac{3}{4}$ inch by $\frac{7}{8}$ inch situated below and in front of the external malleolus. Pain was complained of along the course of the tendon of the extensor longus hallucis. Patient could bear weight on the foot and could walk a few yards with the help of

a stick. There was some limitation of movement in the ankle joint. He refused to remain in hospital until the healing of the ulcer was complete, as during his absence from home troubles of a domestic nature had occurred in his household.

The hospital closed a fortnight later on account of the troops moving down to the plains.

Remarks :—

(1) The accompanying photograph was taken on July 29th (nineteen days after the accident). Volkman's spoon is responsible for the large size of the wound shown.

(2) The open posterior calcaneo-astragaloid and anterior calcaneo astragalo-scaphoid joints are plainly seen in the original photograph.

(3) The wrinkled flabby condition of the sole is largely due to the soddening effect of the bath.

(4) The scraping and counter-opening should have been done when the dislocation was reduced, and the bath or constant irrigation employed from the first.



FIFTEENTH ANNUAL REPORT OF THE ARMY VACCINE INSTITUTE, FOR THE YEAR ENDING MARCH 31, 1904.

By MAJOR E. R. C. BUTLER, ARMY VETERINARY DEPARTMENT.

DURING the year sufficient vaccine for 121,921 persons has been issued, of which 82,360 doses have been sent to the Army and 39,561 to the Navy.

The total quantity supplied since the opening of the Institute is 1,114,568.

RESULT OF VACCINATIONS, AS SHOWN BY RETURNS RECEIVED DURING THE YEAR.

		PRIMARY						Re-vaccinations			Totals
		Infants			Others						
		Perfect	Modi- fied	Failed	Perfect	Modi- fied	Failed	Perfect	Modified	Failed	
Army	{ Home ..	2,937	124	78	1,031	144	19	39,151	17,558	*4,041	65,083
	{ Foreign..	243	13	37	83	41	49	403	186	439	1,494
Royal Navy ..		1	—	—	32	1	—	2,478	1,686	1,139	5,337
Totals		3,181	137	115	1,146	186	68	42,032	19,430	5,619	71,914

* Of these, 3,456 are noted on the returns as showing good marks of previous vaccination.

PERCENTAGES OF SUCCESSFUL VACCINATIONS.

				ARMY		Royal Navy
				Home	Foreign	
Primary	Infants .. ..	..	..	97·52	87·38	100·0 (one only)
	Others .. ..	..	..	93·50	77·46	100·0 (one only)
Re-vaccinations				93·35	57·30	78·53

TABLE SHOWING THE PERCENTAGES OF SUCCESS OBTAINED FROM THE
LYMPH OF EACH CALF.

Number of Calf	Number of Vaccinations, from each calf, for which Returns were received	PRIMARY		Re-vaccinations	Remarks
		Infants	Others		
304	3,889	98·94	96·53	90·44	The re-vaccinations are those on which most reliance is placed statistically as the primary vaccinations are but few in number by comparison
305	227	100·	100·	89·17	
306	2,065	97·92	98·86	93·68	
307	Not issued				
308	1,217	100·	92·86	93·04	
309	1,661	97·44	100·	93·29	
310	1,561	95·09	100·	93·27	
311	1,044	97·78	100·	90·08	
312	2,442	84·80	100·	82·47	
313	1,824	97·78	92·86	86·63	
314	2,162	94·45	96·	93·13	
315	813	100·	100·	93·79	
316	2,692	98·2	100·	91·21	
317	2,780	97·	100·	95·65	
318	973	100·	96·43	93·71	
319	1,417	98·89	100·	94·23	
320	622	100·	100·	94·37	
321	2,875	99·22	98·56	93·66	
322	1,614	100·	100·	96·76	
323	4,655	97·6	100·	92·16	
324	3,326	99·24	100·	92·08	
325	1,255	100·	100·	96·27	
326	1,499	98·04	100·	94·92	
327	1,235	100·	100·	94·32	
328	543	100·	100·	92·41	
329	1,223	98·15	100·	95·80	
330	1,950	100·	100·	93·87	

This table relates to Home stations for the Army only; and the reports from these stations are the ones relied on to shew that the lymph is giving good results.

GENERAL REMARKS.

Thirty-eight calves were used for vaccination and *post-mortem* examinations were made on all except two, which were sold alive. Of these one was tested by tuberculin and the other did not yield a satisfactory lymph.

All calves were found to be healthy.

The lymph was issued as demanded by Medical Officers either in tablets or tubes in the following proportions:—

Tablets (sufficient for five or ten) 18,543

Tubes (sufficient for one, two or five) 16,327

The percentages of success (re-vaccinations, 93·35) shown in the table of results, speaks for the efficacy of the lymph issued, and a table of the percentages obtained from the lymph of each calf is also appended.

In consultation with the Medical Authorities of the Navy and Army some changes, which were foreshadowed in the last Annual Report, have

been made in the method of issue during the past year. These have had for their object the constant supply of small relays of freshly issued vaccine, both at home and to such stations as we supply abroad.

This obviates the necessity of indenting for larger stocks than are required for immediate use at any station and prevents the possible use of an old and perhaps enfeebled vaccine.

From this date (April 1st, 1904), the vaccine is to be issued in hermetically sealed capillary tubes only, unless demanded otherwise for very special reasons, and this "one man, one dose" method will bring the issue of vaccine to the forces thoroughly up to date.

The general methods adopted in the Institute and detailed in the last Annual Report have undergone no changes during the year, except that a mixture of glycerine and sterilised water has been substituted for glycerine only in preparing the lymph pulp for issue. This provides a somewhat more fluid preparation, which is desirable for tube filling and is in no way detrimental to efficiency.

Some practical observations have been made of the method of preparing fresh vaccine with chloroform vapor, as suggested by Dr. Alan Green, and, should emergency arise, it appears to offer a suitable means of rapidly preparing fresh lymph for immediate use.



Editorial.

REJECTIONS ON ACCOUNT OF DEFECTIVE TEETH.

THE rejections observed among men presenting themselves for enlistment and the wastage arising from invaliding on account of loss and decay of teeth, are showing a tendency to increase. So much is this the case, that attention has been for some time attracted to the prominent position which this cause of rejection has come to occupy. The question has been still further accentuated by the fact that it has also become common to make bad teeth a cause of rejection when men are being examined as to their fitness to serve abroad, or as to their being fit for extension of service.

Examination of the recruiting statistics for the years 1891 to 1903, shows progressive increase in the numbers of men rejected for defective teeth, of from 10·88 per 1,000 in 1891, to 49·26 in 1902, and 63·26 in 1903. The rejections had risen to 26 per 1,000 by 1898, after which the figures remained fairly steady for the next three years; then came the large increases in 1902 and 1903, when about 5 per cent. and over 6 per cent., respectively, of the men examined were rejected for loss and decay of teeth.

Whether the progressive increase in the rejections is an indication of increasing prevalence of defective conditions of the teeth amongst the population generally, it is impossible to say. But although there is little exact evidence, there appears to be a very general impression that the prevalence of dental caries is on the increase; and the fact of its widespread extent is abundantly evident from our recruiting returns, and from the observations which have been made regarding the state of the teeth among school children. The large prevalence of dental decay amongst the classes from which recruits are mainly drawn may be partly due to the greater inflow of the population in recent years to town life, and partly also to the more common use of farinaceous articles of food which readily undergo acid fermentation, and probably partly to the use of foods which require comparatively little mastication. Separately from this it must be remembered that a very considerable part of the increase in the number of rejections observed in the recruiting statistics is almost certainly due to medical officers having gradually come to place a higher and higher value on soundness of teeth, as a matter of much importance in its relation to the maintenance of the physical efficiency of the soldier on service.

There is considerable divergence of opinion as to what the chief factors leading to early decay of the teeth really are. Poverty, with insufficient food, dietetic errors, inherited disease, and the unhealthy environment which poverty usually entails, *e.g.*, defective housing, overcrowding and insanitary surroundings, must all be factors powerfully influencing the growth of the body and actively antagonistic to the healthy physical development of its tissues and organs. It would therefore seem reasonable to suppose that the development and growth of the teeth must suffer in proportion to the general malnutrition of the body resulting from the operation of such conditions. On the other hand, while recognising that soundness of teeth is mostly to be looked for as an accompaniment of health and vigour, the available evidence favours the view that decay of the teeth is chiefly the result of local influences, and that malnutrition plays but a small part in the production of dental caries, and that it is neglect to keep the teeth and mouth clean that is principally responsible for the present widespread prevalence of early dental decay.

There is no fixed standard laid down in the recruiting regulations as to the number of lost or decayed teeth which should entail rejection. The decision as to the acceptance or rejection of a recruit depends on his possessing a sufficient number of teeth for efficient mastication ; on the relative position of the defective teeth ; on the presence or absence of opposing teeth ; and on the robustness or otherwise of his appearance. The freedom of judgment given to the medical officer in this matter must be regarded as adding proportionately to his responsibility. It is rare to find a man with every tooth sound, and it is not uncommon to observe that men with very imperfect teeth show no evidence of either dyspepsia or malnutrition. Rejection should, therefore, never be decided upon without careful examination of the defective teeth from the point of view of determining the possibilities of dental repair. In the past, many men have probably been rejected for decayed teeth who might have made good soldiers had suitable dental treatment been available. The recent appointment of army dental surgeons has now made it possible to have the teeth of recruits dealt with from the time they enter the service, and doubtless the recruiting medical officer will be able to accept some of the men who, under former conditions, would have been rejected.

The care and preservation of the teeth of the serving soldier is another most important matter. As it is rare to get men with perfect teeth, so it is essential that early measures should be taken to

prevent caries spreading from unsound to healthy teeth. The men should be encouraged to seek early dental treatment, so that conservative measures may have the best chance of being successful. With the same end in view, recruits should have their teeth examined by the dental surgeon, as a routine measure, as soon as possible after they join. Further, the importance of the care of the teeth and of systematic cleansing should be impressed on all ranks.

While much may be done in this way to preserve the teeth of the soldier, and so lessen the number of rejections within three months of enlistment, and of invalids at a later period, it is obvious that the only way to materially lessen the number of rejections amongst the men presenting themselves for enlistment, is to take every opportunity of advocating the adoption of early measures for the preservation of the teeth, and that these measures be commenced in childhood and steadily continued afterwards. Decay of teeth has very commonly advanced far beyond the possibility of repair by the time the recruiting age is reached. Dr. Leslie Mackenzie in his book on the "Medical Inspection of School Children," states that "by the age of ten or eleven the proportion of children with decayed teeth had risen to nearly four-fifths; but it did not show a material increase at the later ages. The proneness to decay of teeth was, therefore, of early origin. Decay of the permanent teeth was usually associated with decay of the first set" (*report on the children attending certain schools in Aberdeen*). The child should be taught to bestow the same care on his teeth as he is usually taught to bestow on his face and hands, and it should be commenced from the earliest years, because decay in the milk-teeth may originate decay in the permanent set. The teaching of the elements of hygiene should be made compulsory in schools, and in this teaching the care of the teeth should receive special attention. Daily cleansing of the teeth should be enforced by both parents and teachers. Systematic examination of the teeth of children by competent dentists, employed by school authorities, should be practised, where possible, to prevent caries extending, to stop carious teeth, and to remedy defects of the teeth.

Good might also be done by spreading abroad a knowledge of the laws of health and the elements of sanitation amongst the working classes. This might be accomplished by means of special lectures and by distribution of leaflets and pamphlets. Here again the care of the teeth should be an important part of the instruction.

T. McCULLOCH.

Echoes from the Past.

NOTES OF QUEEN VICTORIA'S VISIT TO FORT PITT AND CHATHAM.

By GEORGE RUSSELL DARTNELL.

Deputy Inspector-General of Hospitals, 1855-6.

PART II.

ON the third visit of the Queen to Chatham—November 28th, 1855—she drove as before direct to Fort Pitt, and went round all the wards, above stairs as well as below, expressing herself much pleased with their cleanliness, and the cheerful and contented countenances of the men. Both she and Prince Albert asked several questions about the Medical Staff Corps, seeing many of the orderlies in the wards. On this occasion she did not speak to George Hayward, which was a cause of great distress and vexation to him.

At Brompton Hospital the men were all inspected in the wards, and seeing a Medical Officer in nearly every one of them, the Queen remarked to me that she was glad to see I had so many surgeons. The history of one of the wounded men in this hospital, an Irishman, interested and amused her very much: he had been wounded when retreating after the Cavalry Charge at Balaclava, and was carried a prisoner off the field by the Russians, and detained for upwards of seven months at Simpherapol.

QUEEN: "And how were you treated by the Russians, my poor fellow, did they behave well to you?"

SOLDIER: "Troth, they didn't, Your Worship—Your Majesty, I mane."

QUEEN: "I suppose they gave you plenty to eat and drink, at all events, while you were in the hospital?"

SOLDIER: "Sure 'tis in the hospital I was all the time, Your Majesty; and not a ha'porth' they gave me to ate, only some black bread."

QUEEN (drawing him out): "Well, but you were better off, I hope, in the way of drink?"

SOLDIER: "Oh, but Your Highness—Your Majesty, I mane—that was the worst of all, sorra a drap I had at all, but one glass of nasty sour wine; and all manner of hardships and bad treatment."

QUEEN : "It was lucky after all that you got so well out of their hands at last."

SOLDIER : "So it was, indeed, Your Majesty, and 'tis thankful I am to Almighty God for it."

PRINCE ALBERT : "How did you get away from Simpherapol?"

SOLDIER : "'Tis carried away I was, myself and a parcel more prisoners of us, to Odessa."

PRINCE : "How far is it from Simpherapol to Odessa?"

SOLDIER : "About 700 miles it is, Your Royal Highness."

PRINCE : "And how did you travel? Did you march?"

SOLDIER : "Och! no Sir—Your Royal Highness, I mane, 'tis upon Arabas they took us, about 100 miles a day, an' 'tis the life was a'most joulted out of us."

On quitting Brompton Barracks I said to the Queen, "If Your Majesty is not fatigued, the convalescents from St. Mary's are paraded for your inspection, in the Old Garrison Chapel, on the opposite side of the Barrack Square." "I am not in the least fatigued," she replied, "and should be very glad to see them."

The portico of the Chapel building was decorated with flags and evergreens, and the pavement laid down with crimson cloth; the invalids were ranged in concentric circles round the interior of the Chapel, and the galleries filled with spectators, and as Her Majesty and suite and the staff entered, the scene altogether was very impressive. The maimed and wounded occupied the front row, seated on forms, those behind standing. One fine old soldier (Pte. John Skilley, 88th Regiment) to whom Her Majesty had presented a pair of spring crutches, begged to be allowed to step forward and thank Her Majesty in person; this seemed to affect and gratify her very much. Another remarkable old soldier of the 12th Lancers (Pte. William Penn) attracted her attention also, by his striking soldier-like appearance, and the number of medals and clasps with which his breast was decorated.

As she left the building the Queen said, "How many men, Mr. Dartnell, do you think I have seen here?" I guessed the number at 500, and said so, and on subsequent inquiry I found it was 503.

Before entering her carriage, Col. Eden asked her if she would like to see the new huts just completed for the Sappers and Miners, to which she readily assented, and directly drove over; she examined one hut carefully, asking several questions about them from the Commanding Engineer, Col. Savage. After conversing with him for some time, the Queen walked across the hut

to where I was standing, and said, "These are very nice huts, Mr. Dartnell, do you not think so?" "Yes, Your Majesty," I replied, "I think they are very comfortable," she then suddenly added, laughing, "I cannot help thinking of our friend the Irishman, who laid such stress a while ago on the glass of sour wine he got at Simpherapol." "I fear, Your Majesty, there are a great many others would lay quite as much stress on a similar deprivation." "Well, indeed," she replied, "I'm afraid there are."

On reaching the railway station at Strood, the Queen went into the waiting room for a few moments, while the train was being got ready, she presently came out, bowed very graciously to the officers, who had gone to see her off, and was in the act of stepping into the railway carriage, when she suddenly turned round, walked across the platform towards me, and holding up her forefinger in a playful way, said: "there will be no mistake in the return this time, I hope Mr. Dartnell," laughing as she said so. "I hope not, Your Majesty," I said, "I shall take every possible care to have it correct, and I hope," I added "that the explanation I gave of the last mistake, which you detected in such an extraordinary manner, was satisfactory to Your Majesty." "Oh yes, quite so," she replied "but take care this time, you know," smiling as usual, as much as to say, I shall be sure to detect an error, if you make one; as she certainly would.

The mistake here alluded to was this: In the nominal return, made up for Her Majesty after her previous visit, the name of one of the wounded men was accidentally omitted; the error she immediately detected, and ordered Colonel Phipps to write next day for an explanation, giving not only the man's name, but his regiment, and the nature of his wound, which she must have done entirely from memory, as no notes had been taken, either by herself or any of her suite. From this and the other curious instances given in this little narrative, it is evident that our present Queen possesses in a wonderful degree the same gift of memory which was so remarkable in our old King George the Third, and other members of the Royal family.

On the occasion of Her Majesty's fourth and last visit to Chatham she did not go to Fort Pitt, as her chief object was to see the Crimean soldiers, and there were at that time but five or six in the General Hospital; she therefore drove direct to Brompton Barracks, and more than an hour earlier than the time fixed for her arrival, in consequence of which there was no one in time to meet her at the railway station, and the arrangements

for her reception at the barracks were barely completed when she drove up. She first inspected the convalescents from St. Mary's, of whom there were about 700, all drawn up in a single line along the south front of the Engineer Barracks ; here they were completely under shelter of the range of buildings which fronted the south ; the day was beautifully bright and fine, but with a cold north-east wind, while the sun was so hot that as we went along the line Her Majesty was pleased to remark to me : " This place has been well chosen, Mr. Dartnell, for parading the invalids, it seems like a different climate under the shelter of the barrack ; the sun is quite hot."

The inspection of this line occupied Her Majesty about three quarters of an hour ; many of the cases deeply attracted her attention and sympathy, especially those of two or three men who had been very severely wounded by large grape shot in the face and head ; two of these iron balls weighed 20 ozs. each, another 13 ozs. Photographic portraits were taken of these men and some others, by an artist sent down by Her Majesty, a day or two after.

After completing her inspection of the barrack convalescents, Her Majesty crossed over to the hospital on the opposite side of the square, first taking the medical cases in the Eastern wing of the building ; here she found some soldiers of the British German Legion, to whom she and the Prince spoke a good deal in their native language. The Surgical Division of this hospital contained on this occasion several cases of great interest, among others, one which I pointed out to Her Majesty as " the triumph of surgery," by which term she designated the case in a communication through Colonel Phipps, a few days after. The patient was a young soldier of the 68th Regiment, who had been severely wounded in the right hip, and on whom Mr. O'Leary, the surgeon of the regiment, had very skilfully and successfully performed the operation of excision of the head and neck and a portion of the shaft of the thigh bone, in all upwards of five inches of bone ; the wound had now healed, the man's health was completely restored, a false joint had been formed, and he had very tolerable use of the limb, which was only shortened about 2 inches ; this deficiency was made up by a cork sole to his boot, and although he was not yet able to bear the weight of his body on it, with the help of a pair of crutches presented to him by Her Majesty his progression was easy, and the strength and usefulness of the limb improving every day ; this young man, after his discharge from Chatham, was sent up for a week to the Royal Hospital at Chelsea for exhibition to

the "surgical celebrities" of London, as a case hitherto unparalleled in the annals of surgery, and reflecting the highest credit, not only on the surgeon who performed the operation, but on the whole department.

The next man to whom Her Majesty's attention was directed was a young Dragoon, who had received thirty-one lance and sabre wounds in various parts of the body, which were described to Her Majesty by Staff-Surg. Reade. He received his wounds in returning from the Light Cavalry Charge at Balaklava, was surrounded by a cloud of Russians, by whom he was ultimately taken prisoner, and carried to Simpherapol, where he was detained for upwards of twelve months. The Queen and Prince Albert asked him several questions respecting his sojourn at Simpherapol, and especially how he was treated by the Russians. He told them that although at first they behaved very badly to him and the other prisoners, yet latterly they treated them very well, and that they really had not much to complain of in the way of diet and everything else. The Queen, turning to me and smiling, with rather a comic expression, said: "I am glad to find that they did not behave as badly to all our poor fellows as they did to our friend the Irishman," and as she passed on towards the next, she added: "I forgot to ask that man's name, Mr. Dartnell." "A classic name, your Majesty, John Dryden." "Oh, indeed! I shall not readily forget that name." "Your Majesty," I replied, "seems never to forget anything." She smiled very graciously, and did not seem displeased with the remark. In this same ward was a third man, of whom, after the description by Mr. Reade of his very severe wound, I said: "I should be glad to be allowed to call your Majesty's particular attention to this man; he is a fine old soldier of twenty-one years' service, and from having been in the Regiment (The Royals) with myself, I know him to be as good and brave a soldier as there is in Your Majesty's Army; he served throughout the whole of the campaign, from the first landing of the army in the East to the final assault on Sebastopol, when he received the severe wound of his left arm, for which he is to be invalided; during the whole of that time, I am informed, he was never in hospital, or a day absent from duty. I should also mention to Your Majesty that O'Brien was one of three men who had received a silk handkerchief each, as a present from Your Majesty, but that his was unfortunately lost with his knapsack after he was wounded, which has caused him the greatest distress." The Queen and Prince Albert both seemed greatly interested in the account of O'Brien, who is an exceedingly

fine and soldier-like looking fellow. The Queen said: "I am much gratified to hear such an account of you, O'Brien, and your handkerchief shall soon be replaced for you." The Princess Royal, who had been standing at some little distance during the conversation, asked me what I had been telling the Queen, and on repeating the story to her, she immediately exclaimed: "Oh, I shall take care to send Corporal O'Brien another handkerchief, instead of the one he has lost." The next day a parcel arrived, containing a silk handkerchief, hemmed by Her Majesty, for "John Dryden," and a black morocco leather arm sling from the Queen, and a silk handkerchief from the Princess Royal, both for Corporal O'Brien.

A few days after this Colonel Phipps, by command of Her Majesty, wrote to say that Sir Benjamin Hall, having placed the situation of Superintendent of Park Constables at Her Majesty's disposal, she was anxious to confer it on Corporal O'Brien, if he was found to be fitted for it, and desiring that he should be sent up to Sir Benjamin to be examined and approved. The appointment is a very excellent one, and O'Brien is now fairly and comfortably installed in it. In consequence of the gracious permission given to me by Her Majesty on her first visit to Chatham, I recommended several maimed and wounded soldiers to her for presents of artificial limbs, and other mechanical appliances, all of which were supplied and paid for, through me, from Her Majesty's Privy Purse. These appliances, which were manufactured in the most careful manner, afforded the greatest comfort to the poor soldiers, and were received by them with the greatest pride, and the deepest expressions and feelings of gratitude. Indeed, the sympathy evinced by Her Majesty for the wounded, and her repeated visits to them and their sick comrades in these hospitals, has made a lasting impression on the whole army.

REPORT OF THE ROYAL COMMISSION ON THE WAR IN SOUTH AFRICA.

PROFESSOR ALEXANDER OGSTON'S EXAMINATION—(*continued*).

As the actual volumes of this important report are unlikely to be accessible to the majority of members of our Corps, while the evidence contained in their pages cannot fail to be of interest to our readers, we propose giving a *précis* of the evidence so far as it relates to medical organisation before and during the late campaign. For this summary, which is continued from p. 103, vol. iii., we are indebted to Lieut.-Col. Edwin Fairland. It deals mainly with evidence regarding medical equipment.

(Q. 11,021.) In time of peace I suppose the Army on the whole is very healthy? It suffers from trivial complaints and slight accidents.

(Q. 11,022.) And the experience of the Army Medical Officers is limited to treating those slight complaints? It is limited, and it used to be unnaturally so. I was told by Sir Wm. Stokes that there existed an order at the Curragh that any operation that occurred there was to be sent to the Dublin hospitals for treatment; but I believe the order was cancelled a few years back in consequence of the outcry that was made against it. . . . It was a very unjust slur upon the Army Medical Department that such a regulation should have been issued.

(Q. 11,027.) Then you say in the *précis* of your evidence, "The quantity and quality of the equipment prepared and supplied to the hospitals, field hospitals, and bearer companies were defective and generally they were antiquated and badly organised." What have you to say about the equipment generally? I have mentioned the absence of bacteriological departments, and would add there were no serums for the treatment of disease in any of the hospitals from Wynberg outwards. Those are important, and should not have been wanting in a modern Army Medical Department. There was X-ray apparatus at Wynberg, but none at De Aar, at Modder River, at Kimberley, or Sterkstroom. That was a thing that in those hospitals was absolutely necessary; even supposing that, as I am told, the regulations lay down that it is out of place in a field hospital—which I do not admit—when those hospitals, as at Modder River, acted as base or intermediate hospitals they should have been provided for them.

(Q. 11,028.) Is the X-ray apparatus a very cumbersome thing? Not very cumbersome, but it requires skilled men to work it.

(Q. 11,029.) But I mean to carry about—is it a very big thing? I do not suppose that a flying column could by any possibility carry it with them, but that in hospitals stationary for any considerable time it should

have been provided, I do not hesitate to say. When they were sent out the officers, from want of familiarity with them, which is a part of the equipment of every surgeon at home, were unable to use them. They had not instrument makers or electricians as they have in the German Army. There are instrument-makers attached to every force in the German Army who repair and look after these things. . . . I believe we have none.

As regards equipment, everything was very antiquated. The lights in the hospitals were inadequate for nocturnal operations, and for searching for the wounded in the field—old feeble oil lamps, and candles in lanterns.

On the Continent they use and try in the Army all kinds of modern lamps, paraffin, acetylene, and such better sources of illumination. I do not think such a thing existed anywhere in our forces. It was absolutely impossible to perform satisfactorily an operation by night with the equipment provided, say, at Modder River.

(Q. 11,033.) Do you know whether in the German Army acetylene lamps are provided? I am not sure that they are adopted, but believe that they and similar sources of illumination are on their trial. The one feature of the whole campaign was that there was much less wound septicity than there was, say, in the Soudan campaign, owing I suppose to the small bullets, and to the pure surroundings in which the wounds were often inflicted; but of course there were a large number of septic cases, and the instruments and appliances for the treatment of them were limited and inadequate and old-fashioned. The sterilisers were too small for the work that had to be done. The irrigators for flushing wounds with antiseptics were too small. In Russia they provide the Army in a campaign with little portable stoves and irrigators by which they can prepare, under the most adverse circumstances, for the carrying out of an antiseptic operation properly. Even the cases in which they are contained, made of vulcanite, can be popped into the steriliser and all boiled.

In South Africa each instrument or two had to be sterilised by itself, and those we had were not suitable for sterilising, as they had wooden handles which would have boiled off. They would have been for the most part rejected in such hospitals as we have in every town of any magnitude in Great Britain. . . . I remember one case on the Modder River of opening the skull, for which one nowadays requires a number of cutting forceps which rapidly divide the bone, and enable the operation to be done quickly, accurately and without shock, but there was nothing there but an old-fashioned amputation bone forceps.

(Q. 11,038.) I suppose you must have heard them (the Army Medical Service Officers) comment very often on the instruments which the civil surgeons used? Very severely they commented upon many such

things ; upon their want of modern appliances and modern ideas in the department.

(Q. 11,041.) Were the military surgeons capable of using some of your modern instruments? Many of them were. Not exclusively the younger men. There were a number of admirable Army surgeons there of all grades, some of them exceedingly superior men.

(Q. 11,043.) Does not that rather clash with what you told us just now as to their deficiency from want of experience? No, sir.

(Q. 11,044.) It seems to me not to be quite consistent? No, a talented man is not necessarily a man practically skilled in anything, and however able and theoretically well informed, he may not have the technical facility that only practice will confer. Our operations nowadays are pieces of very high art, which a man acquires by daily training, weekly training. He comes to use his fingers like a conjurer uses his, and does things with his hands that have become a habit with him to do, but which at first are a little difficult and require technical skill. . . . Splints were often wanting, and in most places extension apparatus was not provided. They ought to have been. Often our stores ran short of antiseptic dressings, &c., absorbent wool, even calomel. The drugs were badly designed, cases, 80 lbs. in weight, contained cans of glycerine and of spirit; and to get out what was wanted in suitable quantities was a matter almost of impossibility.

In Russia, they have in times of peace a huge store-house provided with bales of all the materials assorted, large and small ones of all the drugs, and dressings and materials required. A small detachment gets a small bale, and a large one gets greater numbers; and all are labelled outside what they are, and the quantities; and a medical officer in want of something urgent has only to go to a bale to find it. Our drugs were such as you would have found fifty years ago in a chemist's shop, bottles of tinctures and effusions, instead of the compressed tabloids that are now used everywhere. . . .

The Army Medical Department ought to have been organised beforehand with a view to supplying all those tabloids. . . . The department had not had any information before them as to what were good disinfectants and what were not, and they had sent out such disinfectants as, besides carbolic acid, which every one knows, creoline, sanitas, &c., which might be useful enough under certain circumstances, but were not even adapted for a campaign. I think there was no corrosive sublimate in Bloemfontein; at least in the particular hospital where I was. It is best carried in tabloid form . . . sometimes the first dressings were utterly unworthy of England, evidently hastily made up at Capetown. Wrapped up in a piece of paper, by some one not trained to know the importance of purity; not closed, but stitched with a piece of black cotton thread. Inside was a piece of linen, a piece of gauze tissue in the form of cotton wool, quite antiquated from the antiseptic point of view, and two

safety pins lay loose, so that the first thing in opening them in the field was that they would have tumbled out and been lost; and outside was a label paper gummed on describing how they should be used. Plumer's force had no first dressings at all. . . .

The Army Medical Department seemed at first to pride itself on being entirely adequate to conduct the campaign without any external aid. They did not seem to have heard that ever since the American War every big campaign had had as a marked feature of it the employment of voluntary aid—that in the Franco-German campaign of 1870-71, the Russian campaign of 1878, the American War in Cuba, and everywhere, voluntary aid was a great feature with civilised nations, the existence of which could not be overlooked. They had made no provision whatever to deal with that, and seemed rather to resent its appearance.

Eventually they were glad to get the civil surgeons to make up for the deficiency of their own officers, but I do not think that their aid, even at first, was welcomed with any cordiality.

(Q. 11,075.) They knew all about the Red Cross Society and they must have known that they would have the advantage of assistance from them. I do not understand you to mean that they put any impediments in the way of those Societies' work? Yes, I think they did. I think they were jealous of the Red Cross Society from the very first, and impeded its usefulness as well as that of other voluntary agencies.

(Q. 11,076.) Who did that? Who were jealous? The Army Medical Department.

(Q. 11,077.) How did that show itself? The officials of the Red Cross Department mentioned that it was difficult to be of use, as they should have liked to be, and that they were not able to get in touch with, or to supply the Army with, the things for which their funds were provided. There was even an order issued that no Army Medical Officer was to apply to the Red Cross Society for anything, unless it had been sanctioned by his superior authorities. That of itself was almost prohibitory, because away at a distance . . . it was impossible to requisition things at the time they were wanted, and save in the later stages, when the Red Cross Society were enabled to establish dépôts, as they did at Kimberley, the operations of the Society in such places as Modder River really resolved themselves into the provision of a few pyjamas. I think a clinical thermometer or two were once given by the Society at Modder River, but I do not know of anything else. At Kimberley it was, however, different; when they took the schools and public buildings and converted them into hospitals, the dépôt of the Red Cross Society was of considerable service, though it was not an agency by which the deficiencies as regards instruments and modern appliances could be made good.

(Q. 11,078.) In your *précis* you also say "The Army Medical Department were unprepared to deal with such questions as have arisen

in all large wars, as, for example, the organisation and utilisation of Volunteer-aid Societies whose usefulness was thus paralysed," and then you say, "The employment of women and others as volunteer nurses, and as aids in attending to the sick and wounded; the employment of volunteered aid in the form of hospitals and ambulances; many scandalous things resulted from the want of preparation to deal with such matters." What is the sort of preparation that you suggest? There should have been, as in Germany, a Commissioner appointed by the War Office, whose sole function was to organise voluntary aid. That the funds shall be directed in the most useful channels, that ladies who wish to nurse, to arrange for writing communications of the wounded and sick to their friends; to organise refreshment stations for men being transported by convoys or trains—shall be employed—all that is under this official, and under him are organisations of voluntary aid by which the sick and wounded are provided with luxuries suitable for them, such as clothing, food, tobacco, and so forth. All that was wasted in this war, the people did not know what to give, goods were ill-selected and were laid aside. If they gave money it went to the Good Hope or the Red Cross Societies, who were paralysed by want of organisation with the Army Medical Department: and the money was really almost thrown away. . . . My suggestion is to have in future some enlightened official, with a staff, appointed to deal with voluntary aid, to organise it in time of peace, and deal with it in time of war.

. . . . The trains in South Africa were as well done as care and zeal could manage, but they were not what they should have been. They were dreadful things for a man with a bad fracture, or even for a patient badly ill with fever, to go down some hundreds of miles in; and nearly all the cases of typhoid which were transported when seriously ill, either died or had dangerous complications, perforation or hæmorrhage, from being transported in those trains.

The hospital trains were good, but even they might have been improved with regard to the shaking. The other trains were very badly arranged for the purpose. Sometimes there was no water in them, sometimes even orderlies were absent. The carriage latrines were utterly unsuitable, not disinfected; sometimes the wounded were transported in improvised trucks. Hardships must occur in war; but it made one sad to see a man getting his leg, elbows and head knocked about in a springless truck when he was ill and wounded; it was very terrible to behold.

(Q. 11,090.) As to the arrangements concerning sanitary matters, especially in dealing with and preventing pestilences in the field, have you anything more to say in connection with the German and Russian arrangements? In Germany their Army Medical Corps, detailed for sanitary purposes, arrange regarding the water supply immediately any place is reached. The supply is tested bacteriologically and chemically.

and any impure source is closed, or labelled, or put under a sentry; and indications are put up where the good supply is, for the men to go to. In our Army nothing of this kind is done; the water was not tested, nor any measures to secure its being kept clean instituted. The water carts were not regularly disinfected, and they were under drivers who filled them anywhere.

Regarding latrines and so on, in Germany that is most minutely cared for. In our Army we would camp where a previous expedition had passed, and there was nothing to mark where their slaughter house or latrines had been. We were a considerable time outside Kimberley with a number of cases of diarrhoea and typhoid fever; and for three days and two nights there were no latrines dug there, and the men went out into the veldt, and what with heat, and dust storms, and floods, all this was washed about, and of course it disseminated disease. Some of the officers had the duty of being sanitary officers attached to them; but what can one man do? In a camp where he has no men to carry out his instructions whom he can trust, who are trained to do it, the name is nothing. We badly want some sanitary corps, and I see that Mr. Brodrick proposes to institute some such establishment.

(Q. 11,091.) Then in your *précis* you contrast the defects in our service with the well organised German and Russian Armies. What have you to say on that point? . . . I think that there ought to be some class of men very highly trained, so as to be on a footing with our Nursing Sisters, who should receive thorough instruction in anatomy, physiology and disease generally, almost like a medical man who would receive correspondingly high pay. He would be able to superintend the sick, observe dangerous phases, look after the orderlies and the sanitation of hospitals, diet, do the dressings, and assist the Medical Officers. The proper education of the N.C.O.'s of the R.A.M.C. on these lines is most desirable. The men who now enter—there are brilliant exceptions—are not superior to the ordinary soldier. They should receive higher pay, and be more highly trained in harmony with the responsibilities they have to undertake. The Russian Feldscher is trained for three years, receives a similar training to a doctor's, but takes no degree. He can do minor operations and dressings; understands temperatures and the pulse, and all the registration that is necessary regarding the sick. They are a valuable set of men who, so far as I know, do not exist in any other Army in the world.

(Q. 11,095.) Mr. Brodrick was Chairman of his Committee; the members were some of the Army Medical Department, some military men, a representative of the I.M.D., Sir Frederick Treves, Mr. Makins, Mr. Fripp, Dr. Tooth, and Mr. Perry from the Royal College of Surgeons. The Scheme formulated has the elements of good in it. The one point that saved it was that he associated with the Army Medical Department a number of skilled civil doctors and surgeons, who will be able, knowing what is

constantly going on, to advise the Army Medical Department to keep them informed of what might be, and therefore to assist what probably will be. I think it is hopeful.

The ambulance waggons were not suitable to South Africa. They jolted and were old-fashioned—not nearly as good as the German and Russian waggons. The Cape waggons were better, lighter, and held four men instead of two. One hospital had beautiful waggons with tortoise tents that formed part of the waggon itself. Then the stretchers were the same old ones we have known so long. The field hospitals furnished by private individuals were very much superior to the English. In the German Army also, they provide tents, packed into boxes, of full sizes, and used at field manœuvres and in campaigns; England had not one, and there was the greatest want of them, as the storms sometimes blew down the whole of the tents in a hospital where the wounded were lying. . . . Much of the inefficiency in the treatment of the sick and wounded was owing to the antiquated methods in the Army Medical Department. Sufficient attention had not been given to assure that the Medical Officers were well instructed in modern methods in surgery and medicine. . . . I conceive it absolutely impossible that we can ever have a proper Army Medical Department in this country until our Medical Officers, N.C.O.'s and men are allowed to discharge daily, in time of peace, the duties they will have to discharge in time of war. They ought to be encouraged to obtain the most up-to-date knowledge of medicine and surgery in its most modern form in the hospitals. They should be recouped for money expended in special courses of training; and be sent abroad to study the most modern researches. . . . At present in the military hospitals there are male nurses, and most of the cases they have to treat are venereal diseases and trifling ailments, serious sickness is uncommon. They have no instruction beyond First Aid, I think.

(Q. 11,123.) I think that the medical men in the Army had to complain very much of their standing in the Service a few years ago? Yes, my Lord, that is so, . . . from this cause it was a very difficult thing at one time to get thoroughly competent young men to go into the Army Medical Service. There was a change made during Lord Lansdowne's administration. It is partly a question of remuneration, and partly a question of their professional standing. At the present time they are sufficiently paid, there are no complaints on that score; but the second point, touching their position as men of science, is not yet adequately provided for. A medical officer was cut off to a great extent from his own profession; and a number of them naturally looked upon themselves as officers, and aimed at being officers in the Army.

They had not the honest pride in their profession which should have made them greater men than officers in the Army, and which is only obtainable by a man who loves his profession and is constantly educated

in it, who appreciates its advances, and has every facility for acquiring a knowledge of them.

(Q. 11,128.) I think you mentioned that in the German or Austrian Army, the Military Medical Officer was proud of his position, and that he was regarded there as at least equal with the other officers of the Army in every respect? That is so, in every respect.

(Q. 11,129. And you consider that it would be a very great advantage were it so in the British Army? Things never can be right in the British Army until it is so. . . . I should recommend that hospitals be cultivated and fostered in every respect in connection with the Army; that alone would bring about everything else.

(Q. 11,132.) Did you find that a large number of female nurses were employed in South Africa? They were at first refused, save perhaps at Capetown, but they were of enormous value when they were introduced nearer the front. The difference between a hospital where a woman had been introduced, and one that was left to the orderlies was incredibly great—cleanliness, tidiness, care, with charts of temperatures—all that was desirable, was carried out very much better where women were present. I do not think there is anything to prevent women going much nearer the front than has hitherto been assumed to be possible. They have as much courage in positions of danger as men, and the good they do, not merely in the ways I have said, but in regard to the impression they produce, the hopefulness they convey to the sick men who are in danger of death, is almost beyond words to express. For men suffering from dysentery and typhoid, female cooks are almost more important than medicine. . . . Nearly all the Army Medical Corps men took ill; in the few months I was attached to a field hospital nearly all the men died or were invalided from disease, and of nine officers who at different times were attached to it, I think only three escaped typhoid fever or being invalided, several died, and one of those who escaped had just had typhoid in India, so he was probably immune. That was owing entirely to the defective method of disinfection. . . . As regards the physique of some of the Militia regiments, they were boys and weeds. In one expedition, out of 380 of them examined for physical fitness, 212 were rejected as unfit for the toils of a march, and as being liable to disease. . . .

As regards *personnel*, I think about 4 or 5 per cent. of medical attendants ought to be present. 3 per cent. is decidedly too small. . . . That would be a very serious burden to provide for in time of peace, assuming that they were to be on the permanent staff of the R.A.M.C., but if they are of much importance to the Army, they must be provided.

(Q. 11,168.) In order to provide for having men ready in the event of war quickly, do you think it a practical suggestion that the Government might bring in young men, qualified by the medical schools, giving them some grant, and in consideration of that having a call upon them

at once in the event of war? They have in Germany a system, which is the following: that every medical man who has not served in the Army as a doctor, but who is practising as one, receives annually an inquiry whether he is willing to serve in the event of war breaking out; and if so, his place is allotted to him, and he receives some acknowledgment of it, which is adequate to secure his services.

All their University Professors are similarly treated; the most eminent hold military rank, and have to give courses to the younger military officers; and have places allotted to them as consultants if war breaks out. . . . There is no reason why Government should not arrange to compel these young men, in the event of war, so long as they continue under the engagement in peace, to take foreign service as medical men. . . . By such a plan, you would obtain a very fine class of men indeed.

(Q. 11,176.) In your judgment ought the Army Medical Department to have been strong enough before the war to deal with the ordinary requirements for India and Home, and for the 200,000 men in the field in South Africa? I think had they been aware of what was taking place in other nations similarly situated to our own, they would have been much better prepared than they were.

(Q. 11,177.) Are you prepared to advise that we should keep up the normal strength of the Corps for all ordinary peace purposes and for dealing with an Army of 200,000 men in the field in addition? When you saw those poor men suffering, and the enormous waste of life in South Africa, for there is no doubt that enormous numbers of men might have been alive to-day who are not, one cannot but aim at the ideal. . . . It seems to me that our existence as a nation may depend upon our doing so (making full provision). . . .

Throughout the country there are large numbers of those smaller hospitals which would be quite capable of absorbing those A.M.S. officers who obtained leave for the purposes of joining them. . . . Many of these young men are of a very high class, intellectually, so even in provincial hospitals unprovided with teachers they would acquire most valuable information for themselves. Many of them are burning to do it. They have been trained to investigate, to think, and are turned out with their minds active and modern. They go into the Army and at once are surrounded by an impassable wall: they can do no work, they have no material for doing work, and feel themselves lost. . . . The variety of interesting diseases in military stations is exceedingly limited, and the funds supplied for modern apparatus, &c., are not adequate. He cannot investigate the blood, he cannot do microscopic or bacteriological work, or anything else of a skilled nature that is daily practised in our profession. . . . It is false economy to starve the R.A.M.C., . . . with very few exceptions, the orderlies were utterly incompetent to attempt anything of that kind (skilled nursing).

(Q. 11,219.) . . . The Report goes on : . . . " the existence on the part of many military officers of a feeling of distrust of the skill and professional experience of doctors of the R.A.M.C., as compared with civil doctors." It was your experience that there was that feeling of distrust amongst the military officers? I think so; I fear it existed.

(Q. 11,220.) Do you think that feeling of distrust, which very likely erroneously existed, could be got rid of if the military doctors had the training which you suggest — the hospital training? Without any difficulty, I think, because a number of the Army Medical Officers were men so superior that they were recognised on all hands as being at least equivalent to the civilians, and there was no distrust regarding them. Some of them were such brilliant exceptions that their skill was welcomed from all quarters, but there were many of another class who were, I think, distrusted. . . . Their training is insufficient in my opinion. . . . There should be such an officer as you name (a special sanitary officer), and a staff of men to carry out his instructions who have been trained for the purpose, for the prevention of disease. There is no reason why in a campaign the mortality from zymotic disease should be heavier than in a large town. . . . I should not like to censure the Government, because, no doubt, they acted upon advice, but I think that the provision made by Government during the last quarter of a century for the medical attendance upon their Army in the event of a possible campaign has fallen very short of what it should have been. . . . There is not much training to be obtained (for orderlies) in the way of attendance on the sick at a place like Netley.

(Q. 11,245.) A good many of the men come home from India with very poor health, having had tropical disease? . . . My impression would be that a hospital like Netley is quite unfitted to train either the numbers or the quality required.

(Q. 11,246.) In fact, you cannot get wounded men anywhere, can you, and you must put up with the sort of men you get? You can get wounded men everywhere, because civil accidents are quite the equivalent of military accidents, and it is the sick who form the vast proportion of those we have to treat in time of war.

(Q. 11,248.) You are strongly in favour of employing nurses? Female nurses. . . . To form a reserve of nurses would require to be worked out very carefully, because the efficient life of a nurse, during which she is capable of performing such duties as would be required in a campaign, is a comparatively short time—up to about 35 years of age, I think.

End of Professor Ogston's Evidence.

(*To be continued.*)

Current Literature.

Results of the Campaign against Typhoid. — Staff-Surgeon v. Drigalski, Director of the Royal Bacteriological Institution at Saarbruck, discusses (*Deutsche Militärärztliche Zeitschrift*, Heft. 12, 1903) Koch's pamphlet on this subject. Koch has laid great stress upon (1) the enormous importance of contact-infection in the spread of typhoid, which very often occurs quite independently of the water supply; (2) the fact that the human body is the main breeding-ground and disseminator of the virus. After giving a sketch of his ten months' work at Saarbruck, v. Drigalski estimates the value of the Grüber-Widal reaction. This may simply indicate that the patient is, or has been, under the influence of infection. In the absence of clinical symptoms, it must give rise to suspicion; no inference can be drawn from its non-appearance. As a guide to the nature of the case, reliance can be placed, at least to a great extent, on the detection of the typhoid bacillus. Negative results of the bacteriological examination indicate absence of risk of infection by contact. Instances of this latter kind are often unrecognised, even by careful physicians. v. Drigalski next refers to the frequent occurrence of typhoid in certain houses and portions of cities, and to the idea that the organism may remain outside the human body in soil, manure heaps and the like. He thinks that another explanation has been furnished by definite pathological and epidemiological investigations. Bacilli, in small quantities, have been found in the mucous membrane of the rectum; abundantly in the ileum, and always in the duodenum; also abundantly in the gastric mucous membrane (the acid contents of the stomach contain no bacteria); in the oesophagus, in sections of the tonsils, in the parenchymatous organs, often in striated muscles, in the heart-muscle, in the uterus, upon film preparations of the lung (in the absence of pneumonia) and trachea. The condition, therefore, in typhoid is that of "bacteriæmia." If further proof were necessary, it is supplied by the fact that the bacilli are found not only in the urine, but also in the sputum. Moreover, in cases of undoubted infection, we find angina, bronchitis, broncho-pneumonia, influenza, perityphlitis, gastritis, cholecystitis, and otitis media. The bacilli have likewise been demonstrated in the blood of healthy persons who had been in the company of typhoid patients. All these facts are sufficient to account for the existence of endemic foci and "typhoid houses," especially when (as is often the case) overcrowding and other conditions favourable to contact infection simultaneously exist. Infection by contact, *i.e.*, from man to man, through the excreta (the endemic form) is therefore the most important way in which typhoid is disseminated; besides this, should the virus accidentally gain access to water or milk the disease will burst out, in the epidemic form, as an acute exacerbation of the endemic. It is therefore very important to search diligently for all latent or masked cases, to practise isolation and disinfection of the excreta for them as well as for the decided cases; and until the bacilli are no longer discoverable, to endeavour to prevent the spread of the disease from both classes of patients.

T. P. SMITH.

The Medical Service of the Japanese Army.—(Translated from the *Bulletin du Service de Santé Militaire*, No. 536, March, 1904.) At a time when the Russo-Japanese war had just commenced, Dr. Edward Laval conceived the happy thought of asking a personage, who occupies a high post in the Army of the Mikado, if he would be so good as to furnish him with detailed information regarding the Medical Service.

The Japanese military forces form a group of armies under the supreme command of the Mikado; these forces are divided into several armies, each of which is composed of a certain number of independent divisions, the invariable constitution of which is:—

2 Infantry Brigades, 4 regiments.

1 Regiment of Cavalry.

1 Regiment of Artillery.

1 Battalion of Engineers.

1 Squadron of Transport.

The Medical Service is thus provided for:—

At headquarters by a medical officer of the rank of a general of division or brigade, from whom the whole medical service of the campaigning troops receives its orders;

At the headquarters of each army by a medical officer of the rank of general of brigade;

At the headquarters of each independent division by a medical officer of rank corresponding to that of principal of the 1st class of our (the French) army, the director of the medical service of the division, and by two medical officers of rank corresponding to our majors of the 1st or 2nd class;

With each infantry regiment (about 3,000 men) by three medical officers, one per battalion, of whom two are majors and one an "aide-major";

With each regiment of cavalry and artillery, by two medical officers;

With each battalion of engineers and squadron of transport, by one medical officer, usually of the rank of major.

Every independent division possesses, besides, a medical establishment called *groupe de santé*¹, which contains: two medical companies composed of hospital attendants, each company being divisible into two sections. The medical service is represented by a principal doctor, the head of the *groupe*, and eight medical officers (majors or aide-majors) under his orders.

Together with this *groupe de santé* are the ambulances¹, variable in number (four to six per division). The *personnel* of an ambulance consists of a surgeon-major of the 1st class in charge, and six medical officers under him.

Each ambulance can provide for the treatment of about 200 wounded. The equipment, packed in boxes, is analogous to that used in European armies.

The field hospitals¹ belong to the units of the 2nd line. They are under the immediate orders of the commander of the line of communications; their number is variable, as also is their composition. The strength of medical officers is for each hospital from eight to twelve; the medical officer in charge has the rank of surg.-major of the 1st class.

¹ The "*groupe de santé*" is equivalent to the English Bearer Company; the "Ambulance" to the Field Hospital; and the "Field Hospital" to the Stationary Hospital.

At the Base we find, as in Europe, base-hospitals and hospital ships, of which a description has this year been given in No. 3 of *Le Caducée*.

It remains for us to add a few words as to the working of the service on the battle-field.

And first, we must recall the fact that each soldier carries a packet of dressing, of a triangular shape, containing materials analogous to those in use in the dressing packets of European armies.

During the fight the removal of the wounded is carried out by the hospital orderlies, and by the regimental stretcher-bearers (these latter partially furnished from the band) under the orders of the medical officers; this removal takes place under the fire of the enemy, during the fight. Our informant dwelt especially on this point, reminding us of the splendid conduct of our military *confrères* of Japan during the China campaign of 1895 (*sic*).

Under the fire of three ships and four torpedo-boats of the Chinese navy, which, at a distance of 300 to 400 metres, swept with a hurricane of shot a Japanese regiment exposed on the seashore, "the medical officers, followed by the stretcher-bearers and the hospital orderlies, set out one by one for the recovery of the wounded. . . . They collected the dead and caused them to be carried to the rear, picked up and carried those shot but still living, and, at the end of twenty minutes, stretcher-bearers, hospital orderlies and medical officers retired coolly and quietly, carrying off all their dead and wounded, while the Chinese vessels maintained a terrible fire upon them. . . ."

Dressing stations are established at the locality held by the battalion-reserves. Mainly, the care of these stations falls upon the divisional *groupe de santé*, whose duty it is to form as many stations as may be necessary. But, inasmuch as a sudden action may cause the late arrival of the detachment of the *groupe de santé*, the regimental hospital orderlies, together with the medical officer of the regiment, establish this station provisionally. As soon as possible, however, equipment and *personnel* of the *groupe de santé* will come up and take the place of those of the regiments.

As soon as it is judged to be opportune by the divisional principal medical officer, one or more ambulances are installed and carry on their work until such time as they can be replaced by field hospitals. As these latter form part of the lines of communication, the divisional principal medical officer has to demand them from that service.

The equipment of the ambulances and field hospitals is very nearly the same as that of our (the French) ambulances and field hospitals. But the transport differs somewhat. As in the Farthest East the roads are universally bad, and as the regions where the theatre of war is displayed are very mountainous, the Japanese army does not use vehicular-transport for the wounded; the latter are all carried in litters.

Thus, when one comes to examine the Japanese medical service in the field, one finds it in its main features very much like the corresponding service of the present European armies. This fact is not surprising, since it is from Europe that the Japanese have recently drawn the bases of their actual development. It remains for us to watch the results of the actual working of this service which seems to be judiciously organised.

BRUCE SKINNER.

¹ Nimier and Laval, "*Le traitement des blessures de guerre*," p. 75. (Alcan, 1901.)

Correspondence.

THE ANTI-MALARIA FAILURE AT MIAN MIR.

TO THE EDITOR OF THE "JOURNAL OF THE ROYAL ARMY MEDICAL CORPS."

SIR,—I have seen two notices in your Journal regarding the anti-malaria experiments at Mian Mir, in which those experiments are evidently taken very largely on trust as being quite sound, and as suggesting that similar operations made elsewhere are not reliable. I trust that you will allow me to point out to your readers that the work of James and Christophers at Mian Mir is not likely to pass without very close criticism from those who are practically acquainted with this subject, and to indicate three of those points on which I think there will be some discussion. On page 84 of your current issue, the Mian Mir operations are spoken of as "this large scale experiment," but I may point out that the area treated was only between three and four square miles, being merely a small portion of the large military cantonment of Mian Mir. Moreover, according to the report of Capt. James, I.M.S., the whole operations within this area during the year 1892 cost only 7,216 rupees, and of these 5,364 rupees were spent on bricking a single water channel, leaving the sum of only 1,852 rupees (about £140) for the actual cost of the remaining operations. Now it should be remembered that the similar operations at Lagos are costing something like £10,000 per annum, while at Ismailia during last year they cost over £5,000. At Klang the cost appears to have been between £3,000 and £4,000, and at Port Swettenham more than double that amount. At Freetown, Sierra Leone, Dr. Logan Taylor spent over £1,000 for the preliminary drainage which he was able to effect. The expenditure at Mian Mir therefore scarcely appears to justify the work being called a large scale experiment. What the expenditure was during last year it is impossible to say, because, though such a thing can scarcely be believed in a practical sanitary report, Lieut. Christophers does not state it.

The method adopted by James and Christophers for estimating changes in the number of adult mosquitoes present consists merely in giving their personal impressions on the point. It is true that this was done by myself as regards Sierra Leone; but while I was unable to adopt more accurate methods, owing to my short stay there, we should remark that Capt. James and Lieut. Christophers have now been continuously studying this subject for years and should therefore have been able to devise some better gauge for mosquitoes than such an elementary one as they adopted. Even if they had been good enough to have stated the actual numbers of mosquitoes caught, and of occasions on which they were looked for, or to have attempted some kind of numerical estimate, however rough, it would at least have given us some confidence in the results which they claim to have obtained. Unfortunately I have searched their reports in vain for any accurate numerical accounts of this kind.

Their method of determining the change in the amount of malaria present is equally vague. Certainly the examination of native children

for parasites is a good way of arriving at an estimate; but this method must be worked with the greatest thoroughness in order to reach anything like accurate results. Not only should a large number of children be examined, but their ages should be noted, as well as the number of preparations of blood taken and examined from each. Moreover, an elementary knowledge of statistics shows us that in all such cases efforts must be made to determine the mean errors of observation. Instead of all this, we often find in the reports of James and Christophers nothing but the bare percentages, without any actuals regarding the number of children tested and the number of specimens taken. In my opinion such figures are scarcely worth the paper on which they are written. In short, the whole work appears to me to have been of a very trifling nature and completely indecisive as to results, one way or another.

I have never been to Mian Mir, but judging from descriptions of it I should think it would cost well over £10,000 or £20,000 to clear it of malaria, and moreover, the reduction in the disease would probably take several years before it would be appreciable by such rough methods as James and Christophers appear to have adopted. Lieut. Christopher's conclusion that "The destruction of *Anopheles* within an area by attacking their breeding-places is extremely difficult," is really meaningless, owing to the inexactness of the word *difficult*. What may be difficult for an expenditure of a few hundred pounds might be easily effected at an adequate outlay. Malaria at Mian Mir probably cost Government in one way and another some £2,000 or £3,000 a year, representing a capital of £50,000 to £80,000; and it is such a sum—and not a few hundred pounds—which Government would be justified in spending on the extirpation of the disease in that cantonment, on economical grounds alone. It is to be hoped that Government will continue the work on a more practical basis.

Yours faithfully,

RONALD ROSS.

Liverpool,
July 7, 1904.

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Journal
of the
Royal Army Medical Corps.

Original Communications.

NOTES ON ENTERIC FEVER IN INDIA, WITH AN
ANALYSIS OF SEVENTY-FIVE CASES. REMARKS
ON THE TREATMENT OF ENTERIC.

BY CAPT. ERNEST A. BOURKE.
Royal Army Medical Corps.

THESE remarks are based on a series of 75 successive admissions for enteric fever which were under my charge, and were all treated to a termination; of these cases 56 were under my care when doing duty in the plains in 1898 and 1900, and the remaining 19 were under my care when stationed in the hills (Ranikhet) in 1901. Four of the cases occurred among officers, the remaining occurred among British N.C.O.'s and men.

From an experience of two years' observation of enteric fever in the Cork Street Fever Hospital, Dublin, during which time I had charge of a very large number of enteric cases, and from observation of the disease in India, I believe that there are many marked differences in the type of the disease to be observed, yet the general features of the disease are similar.

The onset of the disease is as a rule fairly sudden, so that men report sick during the first week of illness. In my cases the average time that elapsed from the time of the onset to the patient's reporting sick was five days. Headache and general malaise generally usher in the attack.

Rose Spots.—One of the chief difficulties in diagnosing cases of

enteric fever in India, especially in the earlier stages of the disease, is said to be due to the eruption of rose spots being absent in the majority of cases. This is not my experience, and I feel sure that if the eruption is carefully looked for, it will be observed in a large percentage of cases; in 54 (72 per cent.) of the cases that I have recorded in this paper distinct rose spots were noted. Of course in India it is often difficult to feel positive as to the presence of typical rose spots, owing to the patients suffering from prickly heat, &c., yet by carefully marking and observing the suspected spots, a correct opinion may generally be formed. As a rule in India rose spots are not so numerous, and successive eruptions not so well marked as in cases observed in Europe, and cases with a very copious eruption are exceedingly rare.

Temperature.—One of the most marked differences between enteric fever in Europe and cases occurring in this country is observed by comparing their respective temperature charts. The temperature of enteric fever in Europe generally rises in well defined cases, so that at the end of the first week a temperature of 104° or 105° is not uncommon, but in this country such high temperatures are rare; in only one of my cases did the temperature ever rise above 105° , and that in a case which proved fatal. A temperature of over 104° , especially if continued for any period of time, generally indicates a severe attack. We seldom observe the typical charts so frequently seen at home. This of course is partly due to the temperature being so often modified by malaria and partly to the effects of heat; many cases exhibit a remittent type of temperature, the morning temperature falling to almost normal with marked evening rises. Murchison states that, "as a rule to which there are few exceptions, the pyrexia lasts for at least three weeks"; this I believe is the general rule in India as well as in Europe. Yet cases of a mild form do occur in which many of the symptoms of enteric are observed, which, moreover, give a positive reaction to Widal's test; in such cases the temperature may fall to normal in from twelve to fourteen days. The average duration of fever in my cases (excluding fever of relapses) was twenty-three days.

Pulse.—There is one character about the pulse to which sufficient attention has not been drawn, and that is its comparative slowness as compared with the temperature. Even with a fairly high range of temperature a pulse rate of much over 100 is not frequent, more usually the pulse rate varies from 80 to 96; a continued pulse rate of over 100 generally denotes a severe case, and if over 120, especially

if maintained for a few days, very often denotes a fatal termination, at all events in this country.

Thirst, as might be expected, is more marked in a tropical climate.

Diarrhœa is the rule in enteric fever in Europe, and constipation is said to be the rule in India. This statement requires to be modified. In my experience diarrhœa occurs fairly often in this country. In 36, or almost 50 per cent. of my cases, diarrhœa was present, but as a rule marked diarrhœa is not nearly so frequently observed as in cases occurring in Europe; and only a very small percentage of the attacks require active treatment. According to Curschmann, diarrhœa occurs in about one-third of the cases in Europe, in about one-third more there is transitory diarrhœa and in about one quarter constipation.

Constipation was present in 38 of my cases, or about 50 per cent.

Meteorism was present in 15, or 20 per cent. of my cases, whereas according to Murchison about 80 per cent. of cases suffer from this symptom in Europe.

Sleeplessness, often accompanied by delirium of a low, muttering type, is a frequent, and if not treated a dangerous, symptom, and one that frequently imperils the patient's chance of recovery.

Enlargement of the Spleen.—Enlargement of the spleen is so frequently observed in tropical countries that its presence is not much aid as regards the diagnosis. In one of my fatal cases the spleen weighed 36 ounces.

COMPLICATIONS.

Hæmorrhage occurred in 6 of my cases, or about 8 per cent. This is above the usual average. As a rule hæmorrhage, though a serious complication, is not so fatal as usually regarded. Graves of Dublin taught that it was not a very dangerous symptom. In only one of the 6 cases complicated with hæmorrhage did a fatal result ensue (see notes on case 38), this being a severe case with two well-marked relapses, intestinal hæmorrhage and epistaxis occurring in each, the patient eventually dying on the sixty-fourth day of illness, from exhaustion.

Perforation occurred in 3 cases, in each about the twenty-third day of illness. One of these cases was that of a soldier travelling on "relief," and who was admitted about the fourteenth day of illness in a hopeless condition, dying eight days after admission. *Post mortem* showed severe ulceration of ileum and a small perforation with localised peritonitis.

Pneumonia is a comparatively rare complication in this country, it only occurred in 2 or 2·7 per cent. of my cases, whereas in Europe it is generally present in about 10 per cent. of the cases.

Bronchitis is also comparatively infrequent.

Malaria, as a complication, is not infrequent, and often obscures the diagnosis, especially during the early stages of the disease. It occurred in 7 cases, either during the attack or as an early sequela.

Dysentery occurred as a complication in one case.

Relapses are as a rule more frequent and more severe in character than in cases which occur in Europe. Yet they need not necessarily terminate fatally; in 6 or 8 per cent. of my cases, well-marked relapses occurred, only one of which terminated fatally, this being a case with two relapses and severe and repeated hæmorrhages (see notes on case). Curschmann gives 6-12 per cent. as the variation of occurrence of relapses in Europe as distinct from recrudescence.

Inoculation.—Five of the cases (including one death) had been inoculated, all, with one exception, within twelve months previous to admission. Of these cases, 2 occurred among officers, one of whom I myself inoculated only five weeks before the date of onset of illness. This was a severe case attended with relapse and intestinal hæmorrhage. The other officer had been inoculated twice at Chatham just twelve months before attack, this being an ordinary case, followed, however, by a severe relapse, collapse occurring twice, necessitating saline transfusion. Widal's reaction was present in both cases. The case terminating fatally had been inoculated eighteen months previous to admission, was delirious on admission, dying on the eighteenth day of illness. *Post mortem* showed extensive ulceration of Peyer's patches, &c., spleen 36 oz. (see notes on case). Widal's reaction was also present in this case. The remaining two inoculated cases had comparatively mild attacks. The numbers of admissions among the inoculated is of course too small to form any conclusions as regards the protective value of inoculation. I may remark that in the stations from which the cases reported were drawn less than 5 per cent. of the strength had been inoculated. As regards the type of the disease, 3 of the 5 inoculated cases had severe attacks, 2 with relapses, 1 case being fatal.

As Regards the Type of the Disease.—The grave or severe form of enteric characterised by high fever and marked muscular and nervous prostration is the form most commonly observed in this country, and accounts partially, I think, for the very high mortality.

Mild or Abortive Form.—No doubt mild or abortive cases are frequently met with, in which many of the symptoms of enteric are present, and which give a positive reaction to Widal's test. The temperature in these cases falls to normal in twelve or fourteen days from the onset. Two of my cases were such; in both the temperature became normal on the fourteenth day and in one a positive Widal reaction was obtained, the serum not being examined in the other. On the other hand many hold that cases of ill-defined or "Simple Continued Fever," in which the temperature becomes normal on the eighth or twelfth day of illness, are in reality mild cases of enteric fever. In several such cases I have examined the blood for Widal's reaction and always with a negative result, and that such cases are not enteric is suggested by their rapid convalescence and by the absence of the subsequent anæmia and debility which so frequently result from even mild cases of enteric.

The Acute or Septic form, which rapidly progresses to a fatal termination and in which treatment does not seem to have any effect, is occasionally met with. One of my cases was of this type (see notes on Case 62).

The Ambulatory form is also occasionally met with (see notes on case 51).

Mortality.—Of the above 75 successive cases treated by carbolic acid 8 proved fatal, *i.e.*, 10·66 per cent. (this does not include Case No. 15, which proved fatal after four days' duration, as the disease, was not diagnosed during life and patient was not on the carbolic treatment). If we deduct Case No. 42, who developed cancrum oris twenty-seven days after the temperature had become normal (see remarks on Case No. 42), and who died from exhaustion induced thereby, the percentage mortality is only 9·33 per cent.; this compares very favourably with the mortality rate for all India. According to the Sanitary Commissioner's Report for 1900 the mortality rate for India was 29·8 per cent. for European troops—the result speaks for itself.

Remarks.—In enteric fever as occurring in India, though liable to modifications due to the effects of malaria, climate, &c., the type of the disease from a clinical point of view is very similar to that seen in Europe.

The chief differences observed are—

(1) The variations in the temperature charts so frequently observed in India.

(2) The absence of any diarrhoea in about 50 per cent. of the cases.

- (3) The less common *occurrence* of rose spots.
- (4) Its frequently co-existing with malaria.
- (5) More liability to relapse.
- (6) Less liability to be complicated with bronchitis or pneumonia.
- (7) The higher rate of mortality due to the severe type of the disease.

THE TREATMENT OF ENTERIC FEVER.

The treatment of enteric fever may best be considered under three headings, *i.e.*, nursing, dieting and medicinal. In the majority of uncomplicated cases, careful nursing and suitable dieting are the most important. As we have to deal with a long-continued fever, we must try and place the patient in the best possible surroundings, in order to enable him to hold his own against the disease. The patient should be strictly confined to bed from the beginning. A trained nurse should be in attendance, as much depends on good nursing. Food, medicines, &c., ought to be administered at regular hours.

Dieting.—Milk is the most suitable food for an enteric patient; as a rule three pints of milk together with one pint of beef-tea or chicken broth will be found to be a sufficient daily adult diet. It is essential in enteric fever, where the digestive processes are often so much impaired, that the milk be given diluted; for this purpose water or lime water may be added, if this is done it will seldom be found necessary to peptonise the milk. The stools of a patient on a milk diet ought to be examined daily to ascertain whether the milk is digested. If curds are observed in the stools, the quantity of milk ought to be reduced and an equivalent quantity of chicken broth or beef-tea substituted; or if preferred the milk may be peptonised. If diarrhoea is present beef-tea ought not to be given, and if the diarrhoea is severe, eggs in the form of albumen-water will be found not only to be nourishing and easy of absorption, but will also aid in checking the diarrhoea. The albumen-water is made by beating up the white of egg with about twice the quantity of water and straining through muslin; this may be given as a drink or mixed with stimulants should the patient be taking any.

As thirst is such a frequent symptom the patient ought to be encouraged to drink water freely; this will not only relieve the thirst, but will also help to maintain a healthy action of the skin, and by so doing aid in keeping down the temperature. As a rule in mild cases the patient ought not to be aroused from sleep in order to be given nourishment. Sleep is essential for fever

patients, and their night's rest ought to be interfered with as little as possible. When the case is a severe one with stupor and marked muscular prostration, the patient should be roused for food at regular intervals day and night; in those cases also Brand's Essence of Chicken will be found most useful, and can be given when milk or other food is not retained.

As regards stimulants the majority of ordinary uncomplicated cases are better without alcohol. Even in severe cases it is better not to commence the administration of alcohol too early in the disease. When there is marked muscular prostration with delirium, subsultus, and a dry tongue, then stimulants are indicated, and from 6 to 10 (as a maximum) ozs. of whisky or brandy in the twenty-four hours may be required. In many cases with failing pulse and signs of collapse champagne will be found to give the best results.

Hyperpyrexia.—When the temperature rises above 103° cold or tepid sponging should be employed, repeated in a few hours if necessary; in most cases this will be sufficient to reduce the temperature and is often followed by refreshing sleep. Should the temperature rise to 105° the cold-pack will be found efficacious. The patient is placed on a waterproof sheet, then covered with a sheet wrung out of water at a temperature of 65° and more cold water sprinkled over as required, or the patient may be wrapped up in towels wrung out of cold water and constantly changed.

Medicinal antipyretics are seldom needed; antipyrin is depressing. In civil practice the administration of antipyrin, grs. v., to one of my patients was followed by alarming syncope, and the patient was brought round with difficulty. Phenacetin, grs. v., combined with quinine or caffein in small doses, may safely be given.

Medicinal.—Murchison states "that there is no specific for enteric fever" this is true at the present day, yet if we are to obtain the best results we must not confine ourselves to the expectant treatment alone. I feel sure that by adopting some form of antiseptic medication in addition to treating the symptoms and complications as they arise, that we best enable the patient to hold his own against the disease. To get the best results from the treatment with carbolic acid fairly large doses must be given and its administration ought to be commenced early; my usual prescription is :—

Acid carbolic liq...	...	...	...	℥iiss.
Acid sulph. aromat.	...	...	...	℥x.
Aq. chloroformi. ad	...	...	...	℥i.

to be given four times daily throughout the illness, until the temperature has become normal for two or three days. I have observed no ill effects from this treatment, the addition of the aromatic sulphuric acid helps as an astringent and tonic. The carbolic acid acts as an antiseptic and disinfectant, and has also some slight antipyretic action. Even though the carbolic acid only enters the blood in a necessarily very dilute solution, yet it certainly appears to exercise an antiseptic action, as is evidenced by the tongue becoming cleaner, diarrhœa if present becoming lessened and the stools much less foetid; on only a few occasions have I noticed carboluria, which quickly disappeared on the quantity of carbolic acid being reduced. It is difficult to imagine how such a minute quantity of carbolic acid can have any effect on the enteric bacilli, yet judging from the lessened foetor of the stools, &c., it probably has some local intestinal effect, possibly diminishing the production of the bacilli by rendering the soil unsuitable, and probably also exercising a stimulating effect on the intestinal ulcers.

Other antiseptics frequently employed in the treatment of enteric are: salol in 10 grain doses four times daily, and turpentine given in a mixture or in the form of terebene capsules, calomel in repeated small doses, naphthol, carbonate of guaiacol, and chlorine, as recommended by Burney Yeo. Mild cases might get on quite as well without any medicinal treatment and only require careful nursing and dieting; yet it is impossible to tell at the beginning of the attack whether the case will be a mild or severe one.

Diarrhœa.—Diarrhœa should not be interfered with unless the number of motions exceed four in the day, and then only if they are large and watery. In the majority of cases a starch and opium enema will suffice; if it still continues the pil plumbi c̄ opio freshly prepared, repeated every six hours if necessary, may be ordered.

Constipation.—During the first week of illness, should constipation be present, an initial dose of calomel, grs. v., will be found useful, followed throughout the illness by simple warm enemas, repeated every two or three days if necessary. If aperients are required castor oil ℥ii., combined with an equal quantity of glycerine, will be found safe and effectual. Glycerine suppositories are convenient and useful at times.

Tympanites is best treated by hot turpentine fomentations, if excessive, turpentine may be given internally.

Sleeplessness.—This is often a most distressing symptom, and one that if neglected will add very much to the gravity of the case; a good night's rest will often tide a severe case over a critical period.

Sulphonal, grs. xxv., dissolved in warm fluid, will be found to act well. Dover's powder or a hypodermic injection of morphia will often give good results.

TREATMENT OF COMPLICATIONS.

Hæmorrhage is best treated by absolute rest in bed, the application of light ice compresses to the abdomen combined with the hypodermic injection of morphia, grs. $\frac{1}{4}$, repeated daily if necessary. The administration of morphia will be found to give better results than are obtained from the use of astringents. Ergot is disappointing. In many cases lead and opium pills are effective. In 6 out of my last 80 successive cases intestinal hæmorrhage occurred; all were treated by morphia hypodermically and all made good recoveries. The diet in these cases must be restricted as much as possible and given in small quantities at a time. Stimulants ought usually to be withheld.

Pneumonia and Bronchitis.—In addition to stimulating expectorants I would like to point out the marked improvement that often follows dry cupping over the chest. I would also call attention to the value of saline transfusion in severe cases with signs of heart failure and threatened collapse, where stimulants seem to have little or only temporary effect. The saline solution may be injected into the subcutaneous tissue beneath the clavicle, or be given as an enema.

Convalescence.—During convalescence the diet must be carefully attended to, more especially in India, where there is a greater tendency to the occurrence of relapses. No definite rule can be laid down as to when solid food should be given, the state of the tongue and temperature should be our guides. At first it is better to commence with light-boiled eggs, milk puddings and jellies; these may be given when the temperature has remained normal for two or three evenings in succession, and may be gradually added to so that at the end of the first week fish may be given, and should the temperature continue normal, chicken may be given a few days after. The patient ought not to be allowed up until he has been on a part diet for a few days.

It is advisable to give urotropine during convalescence to diminish the spread of infection by the urine.

NOTES ON CASES.

CASE 15.—Pte. D., 1st East Surrey Regiment, aged 22 years, admitted to Station Hospital, Jhansi, on January 2, 1899. States

that he had fever for four days previous to reporting sick. Had slight pyrexia on admission, the temperature becoming normal two days after, and remained normal for eight days, *i.e.*, until the 12th inst., when the temperature suddenly rose to 103°; marked headache, diarrhoea and tympanites rapidly supervened, the abdominal distension became much more marked, and the temperature varying from 102° to 104°, patient dying from syncope four days after the onset of fever. The disease was not diagnosed during life, patient being treated with quinine, tonics and stimulants.

Post mortem.—Marked infiltration and congestion of Peyer's patches throughout the ileum, patches raised above surface and greyish-white in colour, no ulceration, but superficial sloughs commencing to form. Solitary follicles in colon were inflamed. Spleen, 23 ozs. in weight; liver, 73 ozs.; kidneys—chronic inflammation with increase of connective tissue.

The case was one of enteric fever, of a septic type, characterised by an unusually rapid termination (four days), probably due to a general septicæmia.

CASE 21.—Pte. S., 1st East Surrey Regiment, admitted to Station Hospital, Jhansi, on April 1, 1899. This was a severe case with well-marked symptoms of enteric; placed on carbolic mixture two days after admission. Had epistaxis on third day and again on the eleventh day, temperature becoming normal on twenty-fourth day of illness, followed by a relapse in which epistaxis, diarrhoea and rose spots were again marked. Convalescence tedious; one hundred and one days in hospital.

CASE 28.—Pte. B., 1st East Surrey Regiment, admitted to Station Hospital, Jhansi, on May 9, 1899; three days ill previous to admission; epistaxis occurred repeatedly throughout the illness. Rose spots appeared on the eighth day; this was a very severe case with marked nervous symptoms, subsultus, delirium, &c. On several occasions the temperature rose to over 105°, but the application of the ice-pack on each occasion was followed by a fall of from 3° to 4° in the temperature. Patient was treated with carbolic acid and stimulants during the latter course of the illness, the temperature first becoming normal on the thirty-fifth day of the disease. Patient made a good recovery.

CASE 36.—Pte. J., 1st East Surrey Regiment, admitted to Station Hospital, Jhansi, on August 23, 1899, suffering from gonorrhoea; ten days after admission the temperature began to rise, and in a week after the case presented all the symptoms of enteric fever; rose spots appeared on abdomen on the nineteenth day of illness.

Intestinal hæmorrhage occurred twice. The treatment adopted was a hypodermic of morphia, gr. $\frac{1}{4}$, and ice compresses applied to abdomen; patient had a good night, but on the following morning the hæmorrhage was repeated. Morphia was again injected, and repeated on the following day, *i.e.*, the twenty-first. On the twenty-second epistaxis occurred, otherwise the progress of the case was uneventful, temperature becoming normal on the twenty-eighth day.

CASE 38.—Gunner G., 7th Company, W.D.R.A., admitted to Station Hospital, Jhansi, on July 27, 1899; three days ill previous to admission; developed a severe attack of enteric, in which both epistaxis and hæmorrhage occurred, the temperature becoming normal for the first time on the twenty-sixth day of the disease. After remaining normal for a week a relapse ensued, in which diarrhœa was a marked symptom. A second relapse followed in which hæmorrhage and epistaxis again occurred. The intestinal hæmorrhage was successfully controlled by hypodermics of morphia; however, patient became gradually weaker and died on the sixty-fourth day from exhaustion. This case is rather unusual in that there were two relapses in addition to the initial attack, with repeated intestinal hæmorrhage and epistaxis. Morphia on each occasion certainly controlled the hæmorrhage.

CASE 42.—Corpl. T., 1st North Staffordshire Regiment, aged 32, thirteen years' service, the last five years being in India, admitted to Station Hospital, Jhansi, on September 8, 1900; four days ill on admission. This man was much debilitated on admission, and during the previous year had several admissions for alcoholism; indeed, when admitted, he had marked symptoms of incipient "D.T.'s." He had a severe attack of enteric, in which rose spots, diarrhœa and epistaxis were the most prominent symptoms. Patient was treated with carbolic acid, with large doses of bromides in addition, and on account of threatened heart failure stimulants were also given. Temperature became normal for the first time on the twenty-fifth day of illness; convalescence was slow and attended with marked emaciation and weakness. On October 27, 1900, or when the temperature had remained normal for twenty-seven days, a small ulcer was observed on inner side of cheek; this rapidly spread with brawny induration of the surrounding parts, sloughing and perforation rapidly followed, and patient died from exhaustion ten days after. Treatment: nitric acid freely applied, antiseptic applications, &c., all of which seemed to have little effect. Stimulants were freely given. Cancrum oris, though commonly observed in children during convalescence after measles, is a comparatively rare complication after enteric fever.

NOTES ON A CASE OF AMBULATORY ENTERIC.

CASE 51.—Pte. D., 1st Oxfordshire Light Infantry, aged 38, five years' Indian service, admitted from Rest Camp, Jhansi, to Station Hospital on January 18, 1901. History: His regiment left Ferozopore on relief to Byculla, about twelve days previous to admission; he travelled along with the regiment and did not report sick until he arrived at Jhansi, though he stated he felt quite unfit for any work since he left Ferozopore. On admission patient was delirious, tongue dry, brown and coated, temperature 103°, marked tympanites, subsultus and weak pulse, patient being apparently at the end of the second week of enteric fever. His condition appeared hopeless on admission; was ordered carbolic acid, ammon. carb. and strychnine, with brandy; during the time under treatment he showed no signs of improvement, the symptoms became more pronounced and patient died nine days after admission.

Post mortem.—Marked ulceration of ilium, one "pin hole" perforation had taken place near cæcum with localised peritonitis. This case may rightly, I think, be regarded as an example of "ambulatory typhoid."

CASE 52.—*This case had syphilis, ague and enteric fever at the same time.* Gunner H., 32nd Field Battery, Royal Artillery; admitted to hospital on January 22, 1901, suffering from secondary syphilis, mucous plaques, eruption, &c. Two days after admission he complained of headache, and his temperature was found to be 101°. Within a week the case presented the typical appearance of enteric fever with rather severe diarrhœa. On the sixth day of the pyrexia rose spots were observed, and on the tenth day copious intestinal hæmorrhage occurred, successfully treated by hypodermics of morphia. On the twelfth day a typical "ague fit" occurred, repeated at intervals throughout the course of the illness. Patient was treated on carbolic acid and quinine, and during convalescence liq. hydrarg. perchlor. Temperature became normal on twenty-third day, "ague attacks" occurring during convalescence; the attack of enteric fever did not seem to have any effect on the specific eruption.

Two Cases of Enteric Fever in which Collapse occurred, successfully treated by Saline Solution.

CASE 72.—2nd Lieut. E. A. C., 1st East Surrey Regiment, was admitted to Station Hospital, Jhansi, on January 8, 1899. This

young officer was only one month in the country when he was attacked with enteric fever. The case was severe with marked nervous and muscular prostration, delirium and tympanites, with alternating constipation and diarrhœa, while there was a continuous high range of temperature, which only reached normal for the first time on the forty-sixth day of illness. Patient was treated by carbolic acid, with strychnine and digitalis, together with stimulants during the latter part of illness. On two occasions collapse occurred, the pulse becoming almost imperceptible; hypodermics of strychnine had only a slight temporary effect; the case was apparently hopeless, but on each occasion about two pints of saline solution was injected with almost immediate benefit, the pulse becoming perceptibly stronger five minutes after injection on both occasions. I feel sure that the saline transfusion saved the patient's life. Convalescence was tedious and attended by marked emaciation, the officer on admission weighing 12 stone and during convalescence his weight had fallen to $6\frac{1}{2}$ stone. One year after this officer wrote me from South Africa saying he weighed just 14 stone. I may add that he was over 6 feet in height. This case was invalided to England.

CASE 74.—2nd Lieut. H. L. L., R.E., admitted to Station Hospital, Jhansi, on Christmas Day, 1900; this officer had been twice inoculated against enteric fever at Chatham in January, 1900. He passed through an ordinary attack of enteric fever, the temperature becoming normal for the first time on the eighteenth day of illness, and remained normal for twenty days. On January 27, 1901, the evening temperature suddenly rose to 103° due to patient's partaking of some plum-pudding, contrary to advice (at this time the temperature had been normal for twenty days); a few days after it became evident that patient was suffering from a severe relapse. On February 13, 1901, or eighteenth day of relapse, his condition was as follows: low muttering delirium, dry brown tongue, pulse feeble and compressible, diarrhœa, tympanites and subsultus tendinum. In addition to the carbolic mixture, patient was ordered ammon. carb., digitalis and strychnine, and champagne instead of brandy. February 14, 1901, condition very critical, pulse feeble and compressible, temperature 103°; ordered hypo. of digitalin, gr. $\frac{1}{80}$, repeated in six hours. February 16, 1901, patient much worse, collapsed and apparently hopeless. One pint saline solution injected beneath clavicle, followed by marked improvement. Champagne, &c., continued, slept a few hours after the injection. February 17, 1901.—Condition again critical, saline

enema op. given and retained. February 18, 1901.—Patient somewhat better. From this time on patient made a slow but sure recovery, and on March 20, 1901, left for England on eight months' leave, on medical certificate. In this case also I feel sure that the saline solution saved life.

The following is an example of a "septic type" of enteric fever :

CASE 62.—Private W., 2nd Border Regiment, admitted to Station Hospital, Ranikhet, on July 16, 1901, having been previously inoculated for enteric fever in February, 1899. Patient was six days ill previous to admission, suffering from headache, fever, and diarrhœa; when admitted he was delirious, with dry brown and tremulous tongue, a few days after he presented the appearance of a very severe type of enteric fever, *i.e.*, delirium, dry brown tongue, sub-tus, high temperature, feeble pulse, tympanites with enlarged liver and spleen, and diarrhœa. Treated by carbolic with quinine, grs. v., every evening, the symptoms became more pronounced, patient dying comatose on July 25, 1901, *i.e.*, the tenth day after admission to hospital.

Post mortem.—Inflammation of Peyer's patches throughout the entire small intestine with commencing ulceration and sloughing. Mesenteric glands considerably enlarged, blood fluid dark in colon and did not clot. Liver 92 oz., congested. Spleen softened and congested, weighing 36 oz.

Case complicated with Phthisis showing the value of Widal's Re-action.

CASE 65.—Lce.-Corpl. B., 1st East Surrey Regiment, aged 21, three-twelfths year Indian service, admitted to Station Hospital, Ranikhet, for non-venereal warts; a few days after admission he was found to be suffering from tubercle of right apex; shortly after he developed a remittent type of temperature, the symptoms being cough, slight hæmoptysis, night sweats with coated tongue and some slight fulness of abdomen. Blood was examined for Widal's re-action with a negative result; the temperature not showing any signs of improvement, the blood was examined after an interval of a week and gave the enteric reaction. Enteric was then diagnosed, though the only symptoms in addition to above were the high temperature, coated tongue with clean apex, epistaxis, enlarged spleen and some slight abdominal fulness; there were no rose spots and constipation was marked, the stools continuing solid throughout. Carbolic acid was prescribed in addition to the creosote which patient was ordered on admission, the temperature became

normal about the third week of the attack, and patient was making a good recovery when one evening he was seized with abdominal pain, temperature fell to 95° and signs of collapse and vomiting set in, patient improved somewhat under stimulants and morphia, but the temperature never rose above 95° and peritonitis set in, patient dying five days after from collapse.

Post mortem.—Tubercular deposits in right apex of lung, typical enteric ulceration of ileum. One ulcer near cæcum had perforated, giving rise to peritonitis, the intestines being adherent and covered with flakes of lymph. After death it was discovered that on the day patient was seized with the sudden abdominal pain, a comrade had managed to give him unobserved two green apples to eat.

The points of interest about the case were the absence of most of the usual symptoms of enteric fever, the stools remaining solid throughout, the temperature remaining under 95° both in axilla and in mouth for five days; the diagnosis being made on the Widal re-action and proved by the *post-mortem* examination.

Case with marked Somnolence.

CASE 71.—Pte. B., 1st East Surrey Regiment, aged 20, admitted to Station Hospital, Ranikhet, on October 17, 1901, states that for the three days previous to admission he had felt feverish and sleepy. On admission tongue coated, temperature 103°, patient very dull and drowsy; one week after admission his condition was as follows: patient very drowsy, sleeps practically night and day, and can be roused with difficulty; coated tongue, sordes on lips and teeth, irregular and compressible pulse, continuous high fever, abdominal distension, rose spots and constipation. Treatment: carbolic and digitalis. October 27, 1901.—Condition very critical, can be roused with difficulty to take his nourishment, lies apparently in a heavy sleep day and night. October 29, 1901.—No improvement, pulse irregular and compressible, dry brown tongue, motions passed involuntarily, cannot be roused sufficiently to take his food, necessitating his being fed by nutrient enematas; ordered champagne and strychnine. November 1, 1901.—Much improved; seems now more conscious and takes his food fairly well. Champagne and strychnine continued, still continues to sleep day and night, but can be roused for a short time.

November 2.—Very stupid and drowsy still; from this time recovery was uninterrupted but slow, and during convalescence patient showed no signs of drowsiness.

REPORT OF 75 SUCCESSIVE CASES OF ENTERIC FEVER TREATED WITH CARBOLIC ACID.

No. of case	Regiment or Battery	Rank	Name	Service in India	Age	Date of admission	Days ill before admission to hospital	Duration of fever	No. of days in hospital	Diarrhea or Constipation	Rose Spots	Result	Remarks
1	1st E. Surrey Regt.	Private	D. W.	3 years	23	5/10/98	4	25 days	68	Normal	Present	Recovery	Mild case.
2	32nd F.B.R.A.	Gunner	W. T.	1 1/2 "	23	19/10/98	3	20 "	72	D.	Absent	"	"
3	1st E. Surrey Regt.	Private	T. S.	1 1/2 "	23	17/11/98	3	20 "	50	"	Present	"	"
4	3rd Hussars	"	S. G.	1 1/2 "	25	24/11/98	5	18 "	37	"	"	"	Severe case, complicated with pneumonia.
5	Royal Artillery	Gunner	G. T.	1 1/2 "	26	20/11/98	?	19 "	34	"	"	"	Mild case.
6	1st E. Surrey Regt.	Lce.-Corpl.	T. T.	1 1/2 "	22	25/11/98	7	22 "	48	"	"	"	Severe case, marked nervous symptoms.
7	"	Private	T. S.	1 1/2 "	24	17/12/98	8	15 "	42	D.	"	"	Mild case.
8	32nd F.B.R.A.	Gunner	S. P.	1 1/2 "	22	31/12/98	6	13 "	45	C.	"	"	"
9	"	"	P. W.	1 1/2 "	22	2/1/99	6	26 "	58	D.	"	"	Severe case, copious eruption.
10	1st E. Surrey Regt.	Private	W. D.	1 1/2 "	20	3/1/99	6	"	"	C.	Absent	"	Mild case.
11	Royal Artillery	Gunner	D. B.	1 1/2 "	24	4/1/99	5	35 "	Over 3 months	D.	Present	"	Severe case, marked nervous symptoms. Invalid.
12	"	"	B. C.	1 1/2 "	24	6/1/99	6	18 "	18	"	"	Died	Severe case, complicated with pneumonia.
13	1st E. Surrey Regt.	Private	C. D.	1 1/2 "	21	7/1/99	7	16 "	"	D.	"	Recovery	Severe case, died from perforation.
14	"	"	D. C.	1 1/2 "	21	8/1/99	4	23 "	55	D.	"	"	"
15	"	"	C. S.	1 1/2 "	22	12/1/99	"	"	4	D.	Absent	"	See notes on case.
16	Royal Artillery	Gunner	S. D.	1 1/2 "	26	12/1/99	1	19 "	50	C.	Present	Recovery	Mild case.
17	"	"	S. I.	1 1/2 "	21	2/2/99	3	27 "	"	C.	"	"	Severe case.
18	1st E. Surrey Regt.	Private	D. T.	1 1/2 "	25	10/2/99	8	"	"	"	"	Died	"
19	7th Co. H.B.R.A.	Gunner	I. T.	1 1/2 "	24	31/3/99	3	35 "	71	D.	"	Recovery	delirium, subsultus, &c. marked diarrhoea.
20	1st E. Surrey Regt.	Private	T. S.	1 1/2 "	21	31/3/99	3	22 "	65	D.	"	"	"
21	"	"	S. M.	1 1/2 "	21	1/4/99	1	24 "	101	D.	"	"	&c.
22	"	Bugler	M. B.	1 1/2 "	15	4/4/99	5	relapse, 15	"	"	"	"	Severe case. See notes on case, relapse, &c.
23	"	Private	B. W.	1 1/2 "	24	11/4/99	6	26 "	67	C.	"	"	Severe case.
24	Royal Artillery	Gunner	C. B.	1 1/2 "	26	12/4/99	4	28 "	80	D.	Absent	"	delirium, subsultus, &c.
25	"	"	C. B.	1 1/2 "	24	29/4/99	6	14 "	31	C.	"	"	Mild case.
26	1st E. Surrey Regt.	Private	B. B.	1 1/2 "	22	2/5/99	5	24 "	50	D.	"	"	Severe case.
								16 "	45	"	"	"	Mild case, complicated with retention of urine.

27	Royal Artillery	Gunner	H.	4 years	23	2/5/99	?	14 days relapse, 13	—	—	—	Absent	Recovery	Mild case, followed by severe relapse.
28	1st E. Surrey Regt.	Private	B.	4 "	25	9/5/99	3	35 days	76	D.	Present	Present	"	Severe case; hyperpyrexia, epistaxis.
29	" "	"	P.	1 1/2 "	18	11/5/99	6	27 "	53	C.	"	"	"	See notes on case.
30	" "	"	T.	1 1/2 "	16	11/5/99	6	20 "	62	C.	Absent	"	"	Mild case, followed by marked anemia and debility.
31	" "	"	F.	1 1/2 "	21	13/5/99	6	31 "	57	C.	Present	"	"	Mild case.
32	" "	"	G.	1 "	22	14/5/99	3	24 "	58	C.	"	"	"	Severe case, sore throat and epistaxis.
33	" "	"	E.	2 "	25	17/5/99	8	27 "	65	C.	—	"	"	Mild case, epistaxis.
34	" "	"	C.	4 "	26	28/5/99	—	—	50	D.	—	"	"	Severe case, sent on sick leave to Kasauli.
35	Royal Artillery	Gunner	S.	3 "	25	30/5/99	4	28 days	70	D.	Absent	"	"	Severe case, complicated with ague.
36	1st E. Surrey Regt.	Private	B.	1 "	21	23/8/99	4	28 "	99	D.	—	"	"	" " bi-pneumonia.
37	" "	Boy	G.	1 1/2 "	15	28/10/99	3	21 "	—	C.	—	"	"	" " hemorrhage, &c. See notes on case.
38	Royal Artillery	Gunner	G.	5 "	27	7/4/00	3	26 "	64	D.	Present	"	"	Mild case, transferred as convalescent.
39	1st N. Stafford	Private	M.	1 "	21	26/4/00	3	19 "	56	C.	—	Recovery	"	Severe case, hæmorrhage, &c. See notes on case.
40	" "	"	M.	2 "	23	6/5/00	2	14 "	45	C.	—	"	"	Mild case, phlebitis.
41	" "	"	C.	2 "	22	4/8/00	4	21 "	57	D.	Present	"	"	" " inoculated in 1899.
42	" "	Corporal	T.	5 "	32	8/9/00	4	25 "	59	D.	"	Died	"	" " "
43	" "	Private	W.	1 "	26	4/11/00	5	17 "	38	C.	"	Recovery	"	Severe case, died during convalescence from cancerum oris. See notes on case.
44	" "	"	D.	1 1/2 "	22	16/11/00	4	28 "	67	D.	"	"	"	Mild case.
45	" "	"	B.	1 "	23	19/11/00	4	30 "	64	C.	"	"	"	Severe case, marked diarrhoea and nervous symptoms.
46	" "	"	B.	3 "	29	20/11/00	7	21 "	60	D.	"	"	"	Severe case, inoculated in 1899.
47	Royal Artillery	Sergeant	McL.	3 "	28	11/12/00	6	23 "	Over 3 months	D.	"	"	"	" " hæmorrhage, relapse, &c.
48	1st N. Stafford	Private	M.	1 "	22	11/12/00	4	19 "	41	C.	"	"	"	" " "
49	" "	"	W.	1 "	21	14/1/01	3	—	—	C.	Absent	"	"	Mild case, Vidal's reaction present.
50	" "	"	G.	1 "	21	15/1/01	8	—	—	C.	Present	"	"	" " "
51	1st Oxford L.I.	"	D.	5 "	38	18/1/01	14	—	9	C.	—	"	"	Severe case, delirium and nervous prostration.
52	Royal Artillery	Gunner	H.	5 "	28	22/1/01	—	23 days	64	D.	Present	Died	Recovery	Perforation. See notes on case.
53	2nd A. & S. Hhrs.	Private	H.	4 "	24	14/3/01	4	27 "	117	D.	"	"	"	Severe case, complicated with hæmorrhage, secondary syphilis, and malaria. See notes on case.
54	3rd Hussars	"	Y.	2 "	24	28/4/01	4	26 days	81	D.	"	"	"	Severe case, followed by relapse and dysentery.
														Severe case, severe hæmorrhage, delirium, &c.

REPORT OF 75 SUCCESSIVE CASES OF ENTERIC FEVER TREATED WITH CARBOLIC ACID.—(Continued.)

No. of case	Regiment or Battery	Rank	Name	Service in India	Age	Date of Admission	Days ill before admission to hospital	Duration of fever	No. of days in hospital	Diarrhoea or Constipation	Rose Spots	Result	Remarks
55	2nd A. and S. Hhrs.	Private	P.	4 years	19	27/5/01	1	19 days	65	C.	Present	Recovery	Mild case.
56	2nd Border Regt.	Lee.-Corpl.	B.	3 "	26	29/5/01	3	25 "	54	C.	"	"	Severe case.
57	"	Private	B.	3 "	25	5/6/01	3	25 "	115	D.	"	"	" phlebitis, subultus, &c.
58	2nd A. and S. Hhrs.	"	G.	3 $\frac{1}{2}$ "	25	11/6/01	8	15 "	40	D.	"	"	Mild case, epistaxis.
59	2nd Border Regt.	"	O.H.	5 "	26	14/6/01	4	21 "	63	C.	"	"	Severe case, Vidal's reaction; had enteric in 1899.
60	2nd A. and S. Hhrs.	"	McK.	4 "	25	29/6/01	10	18 "	51	C.	"	"	Mild case.
61	"	"	C.	3 "	22	3/7/01	8	18 "	44	C.	—	"	"
62	2nd Border Regt.	"	W.	4 "	24	16/7/01	6	—	6	C.	"	Died	Severe case, inoculated. See notes on case.
63	2nd A. and S. Hhrs.	"	B.	1 $\frac{1}{2}$ "	20	18/7/01	10	18 "	79	D.	"	Recovery	Mild case.
64	2nd Border Regt.	"	D.	1 $\frac{1}{2}$ "	22	12/8/01	6	21 "	89	D.	"	"	" followed by marked debility.
65	1st E. Surrey Regt.	Lee.-Corpl.	B.	1 $\frac{1}{2}$ "	21	12/8/01	—	—	24	C.	Absent	Died	Complicated by phthisis. See notes on case.
66	2nd Yorks. Regt.	Private	D.	1 $\frac{1}{2}$ "	27	3/9/01	6	34 "	89	D.	Present	Recovery	Very severe case, collapse.
67	2nd A. and S. Hhrs.	"	M.	3 "	30	16/9/01	5	20 "	—	D.	"	"	Mild case, with marked diarrhoea.
68	1st E. Surrey Regt.	"	C.	1 $\frac{1}{2}$ "	21	2/10/01	—	16 "	82	D.	"	"	Severe case.
69	2nd Border Regt.	"	M.	1 $\frac{1}{2}$ "	24	15/10/01	3	14 "	70	D.	"	"	Mild case.
70	"	"	C.	1 $\frac{1}{2}$ "	24	12/10/01	4	—	95	D.	"	"	Severe case, severe diarrhoea.
71	1st E. Surrey Regt.	"	B.	1 $\frac{1}{2}$ "	20	17/10/01	3	—	—	C.	"	"	" extreme somnolence. See notes on case.
OFFICERS.													
72	1st E. Surrey Regt.	2nd Lieut.	E. A. C.	1 $\frac{1}{2}$ "	20	8/1/99	8	46 "	About 3 months	D.	—	Recovery	Severe case, continuous high temperature.
73	6th Madras Inf.	Lieut.	H. N. Y.	4 $\frac{1}{2}$ "	25	3/2/99	7	15 "	—	C.	Present	"	Mild case.
74	Royal Engineers	2nd Lieut.	H. L. L.	1 $\frac{1}{2}$ "	22	25/12/00	3	18 "	89	D.	"	"	Severe case, relapse. Vidal's reaction present, collapse. See notes on case.
75	1st N. Staff. Regt.	"	F. C. T. E.	1 $\frac{1}{2}$ "	24 $\frac{1}{2}$	2/1/01	3	21 "	56	D.	"	"	Severe case, repeated hemorrhages. See notes on case.

ST. LUCIA, WEST INDIES.

BY LIEUT.-COL. F. P. NICHOLS.

Royal Army Medical Corps.

Geographical.—St. Lucia is the most northerly of the Windward Islands group, consisting of itself, St. Vincent and Grenada. It lies about half-way between Martinique (twenty-four miles) and St. Vincent (twenty-one miles), and is ninety miles west-north-west of Barbados. It is twenty-seven miles long, fourteen miles broad, and has an area of two hundred and thirty-eight square miles—about the size of the Isle of Wight.

Geological.—It forms a portion of the great volcanic ring that surrounds the Caribbean Sea, and is comprised of basaltic rocks, tufas and lavas, with a clayey soil resulting from their disintegration. It is very mountainous, the main natural feature being a longitudinal ridge, with frequent transverse spurs enclosing deep ravines with cultivable bottoms. The hills, which rise, rugged and precipitous, to over three thousand feet, are clothed with dense forest reaching to the bottoms of the ravines and valleys, the larger of which are under sugar and cocoa cultivation.

Towns.—The only town is Castries, lying at the head of the harbour—a port and second-class naval coaling station. It is an insignificant collection of wooden shanties in parallel streets, and boasts some twelve thousand inhabitants.

Harbour.—The harbour is a small, deep, land-locked bay, where steamers of deep draught can lie alongside the wharves. There are a few villages round the coast which can be reached by a daily steamboat. A small-scale map of the island is published.

Government.—St. Lucia is a Crown colony and boasts an Administrator, a Legislative and Executive Council, and the usual civil officers. The Governor's headquarters are at Grenada.

Population.—The population of the island is about fifty thousand, of which perhaps five hundred are white, five thousand coloured, and the rest black. They speak French *patois*, have French sympathies, and are mostly Roman Catholics.

Climate.—The climate is healthy provided reasonable precautions are taken. The temperature ranges between 75° and 85° F. during most of the year. I have registered 65° in January and 90° odd in July. It is a wet place, the average rainfall being over 100 inches, and the rain is very uncertain in distribution. May to November

are the wettest months; December to April probably the driest. Few days are quite rainless, but from the steep slopes rain runs off quickly, and as the showers are mostly heavy and short there are few days on which one cannot go out.

The Morne, Vigie and Toc, where the garrison is quartered, are cool and breezy; the sun is seldom powerful enough to need the use of a large hat; the nights are practically always cool. The temperature being high and the air moist, exertion produces sweating, and chills have to be guarded against by suitable clothing and common sense. Avoid mosquitoes, chills and cocktails. Ague is common among those who breed mosquitoes round their houses. Ladies and children keep their health well.

Locomotion.—Roads are bad and steep; riding is practically a necessity, and is the only way to see anything of the exquisite beauty of the island. There is one flat road, but the roads to Morne, Toc and Vigie are practicable for carriages. Bicycles are useless. Narrow riding tracks cut through the jungle lead you to the interior of the island. Walking is unpopular, but not to be despised.

Products.—The island produces little but sugar, cocoa and fruit. Meat, flour and potatoes are imported. Chickens, fish, vegetables and fruit are fairly plentiful and cheap. Flowers, ferns and flowering trees abound. There are few wild birds and fewer mammals—the mongoose, the agouti and the maniocou (a marsupial) among the latter. Snakes are talked about, but seldom seen.

The Garrison.—The garrison, whose headquarters are at Barbados, consists at present of one company Royal Garrison Artillery; one company local Royal Garrison Artillery; two companies West India Regiment, and details, bringing the total to six hundred.

In course of time (which is variously estimated) the headquarters and Barbados garrison will be located here, and fine barracks are being rapidly built for their accommodation. Then the white troops (600) will be quartered on the Morne, 840 feet above sea-level; the black infantry at Vigie, 400 feet; and the local Royal Garrison Artillery at Toc, 500 feet. At present Toc and Vigie alone are occupied.

Royal Army Medical Corps.—The Station Hospital, a new building, is at Vigie (fifty-two beds). There are three R.A.M.C. officers and five non-commissioned officers and men. The Medical Officer in charge of troops, who is also Officer Commanding the Station Hospital, has an excellent quarter on the Morne (three bedrooms), with a large garden. Two junior officers are stationed at Vigie, one of them in fine new quarters built for a Major, R.A.M.C.

Headquarters are at Barbados, where the Senior Medical Officer resides. The Principal Medical Officer, West Indies, visits as an Inspecting Officer.

Tour of Service.—The tour of service is three years, which is usually divided between St. Lucia and Barbados.

Allowances.—Allowances are good, amounting to £10 1s. 6d. per month of thirty-one days. This includes forage, which junior officers are generally able to draw, but not "Military Duty Allowance," which varies with rank from 3s. 6d. to 1s. 7d. per day. There is also charge allowance for fifty beds.

Steamship Lines.—There are various steamship lines which call at the port, but practically the only useful one is the Royal Mail, sailing from Southampton on alternate Wednesdays. They reach Barbados on the following Monday week (twelve days) at 6 a.m. Here they connect with the Inter-Colonial vessels, one of which leaves for St. Lucia at 5 p.m. the same day, arriving at about 6 a.m. on Tuesday. Through fare, 1st class, £35 and £25, according to cabin accommodation, but officers are granted the best accommodation at £25. Reduction for children and baggage, 20 per cent. The vessels are fairly good, but apt to be crowded in winter, when the tourist prevails. Other lines are the "Direct" (Scrutton and Co.), and Pickford and Black from Halifax, but these are uncertain and unsatisfactory.

Telegrams and Telephones.—Telegrams cost 4s. 7d. per word. There is a telephone system throughout the island.

Postal Facilities.—As the mail steamer arrives on alternate Tuesdays and leaves the following Friday week, it may be noted that undue haste is not cultivated in these parts. There are uncertain weekly mails to and from Barbados.

Uniform.—Khaki is practically the only wear, but it is safer to bring all one has. Mess kit is white jacket and cloth overalls, with cummerbund. Full dress, white. The service hat is worn, also the white helmet. Plenty of khaki breeches are needed, but can be procured here for 16s. per pair. White and khaki uniform can be made cheaper than at home, though the cut is not very good. Bring plenty of boots; Wellington, ankle, long brown, and gaiters. Ammunition boots from stores are the only wearable ones to be got here.

Saddlery.—Saddlery for ponies should be brought, better old than new, for climate and grooms are adverse. Regulation saddlery is not used, but may be required in Barbados. Pony harness should be brought if a trap is considered a *sine quâ non*, as island harness and leather of all sorts is useless.

Boxes.—All spare saddlery and clothing should be kept in good air-tight boxes. The Army and Navy Stores regulation army chests, zinc lined, are excellent.

Mufti.—For mufti, thin serges, light tweeds, flannels, tennis shirts, thin summer underclothing, plenty of linen, pyjamas, straw hat or panama, strong walking boots (brown for preference), tennis shoes, a good light mackintosh coat or cape, and a sound umbrella. Personally, I find a few brown holland washing suits, made in India, very useful, and provocative of envy. Of course the usual thin dress suit and dinner jacket, and blazer or flannel coat.

Furniture.—Any good furniture required should be brought, but sufficient can be picked up locally if you are content with necessities only. Light folding beds, camp chairs and looking glasses should be brought. A few good rugs for the floor and plenty of light draperies, curtains and so forth, hide deficiencies. Pictures get spoiled and books ruined, in spite of care. Nothing can be hired and everything brought should have been in use to avoid paying import duty. "All articles of personal and horse equipment necessary for military duty; all passengers' luggage, including wearing apparel and other articles in actual use; personal effects of passengers, including articles of furniture in use," are free.

Plate and Crockery.—Bring all plate, cutlery, and crockery; nothing even tolerable can be bought, and they will sell well on departure.

Shops.—The shops are inferior general stores, catering for the natives, and quite devoid of anything tasteful. The usual tinned and bottled goods can be procured at about double their value. Cheap underwear and dress goods can be got, and there are one or two tailors and a dressmaker. Do not go on the analogy of India. The smallest up-country station is better off in stores than St. Lucia.

Cost of Living.—Living is expensive, as all imported goods pay heavy duties, and flour, oatmeal, and such like bulky articles are double home prices. Beef is poor, but about the same price as at home; mutton can only be got once a week. There is no fresh butter, and that imported is dear and bad. Milk is fairly good and plentiful, at about English prices. Poultry about the same price as at home, but poorer; eggs also. Fish cheap; vegetables dear; and fruit very cheap; wines and spirits much as at home; there are some good French clarets at reasonable prices. The "Military Duty Allowance" is meant to cover import duties, and does so in the case of a bachelor, who can practically live on his allowances.

Currency.—The currency is English silver, and five-dollar notes ; no gold. Perhaps a good housewife's main anxiety is the procuring of supplies, owing to distance, weather and domestic stupidity.

Servants.—Servants are, on the whole, good and cheap. Butler, 10 dollars ; groom for two ponies, 10 dollars ; cook, 7 or 8 dollars ; messenger (needful), 5 dollars ; grass boy, 3 dollars. A bachelor's servants cost about £7 a month ; a family's about £12. They feed themselves, but require bedding. I should not advise bringing white servants of any sort.

Horses and Ponies.—Some bigger animals are now being bred in the island, but the usual size of Creole or country-bred ponies is 13 to 14 hands. They are useful, if not handsome, and do well enough for getting about on. The price runs between £12 and £15. Half-breds of better appearance fetch £15 to £20.

Forage.—The forage allowance covers the keep of a pony easily.

Dogs.—Short-haired dogs do well.

Hotels.—There is only one possible hotel, and that is only possible for a day or two. No boarding houses. This is recognised, and private hospitality generally supplements public deficiencies. Quarters are always available for us, and can be occupied in a couple of days.

Sport and Amusement.—There is a race-course three miles from Castries, where an annual meeting is held. Polo is played on a saddle-back clearing, near the Morne. Ponies must be under 14 hands. There is a cricket ground in Castries. The Officers' recreation club on the Morne supplies lawn-tennis and croquet. There is a racquet court at Vigie ; golf links are talked of ; no shooting ; fishing and boating are not patronised, but should be worth cultivating ; riding consists of crawling up and down steep hills, along bridle paths, in exquisite scenery ; football and hockey are played sometimes by lunatics ; bicycling is scarcely possible. Trips to the different villages and planter's estates are interesting but difficult, owing to the lack of inns. The "Souffriere," an extinct volcano, and "Solfatara" are worth visiting ; there is a bungalow which can be hired, and the change to 1,200 feet is pleasant. The other islands can be visited on short leave, which can be extended to fourteen days. There is a garrison and also a public library.

Procedure on Arrival.—The steamer comes alongside. An A.S.C. subordinate is present to assist officers ; carts can be procured at once, and a trap in a few minutes. Stanble's Hotel is possible for a day or two. It is near the garrison office, where the Commanding Officer's book is kept. The office of the Medical

Officer in charge of troops is at the Station Hospital, Vigie, across the harbour. Government House, which should be visited early, is half-way up the Morne.

Hints for Ladies and Children.—A white nurse is only a nuisance. Children do well for a year. Usual thin summer clothing required. Washing materials best. Washable riding habits. Saddle and bridle for 13 to 14 hands pony. Cheap silks go to pieces. Gloves must be kept in tins or bottles. There is a dressmaker and milliner. Dinners, occasional dances, at homes, lawn-tennis, &c., are to be expected. Schooling can only be got in Castries, where there is a mixed class boys' school, and a convent school for girls. Neither are very satisfactory. It is worth while bringing out a good supply of groceries and paying duty on them.

The above are facts. Perhaps, on the strength of a year's residence, both *en famille* and *en garçon*, I may be permitted a few inferences.

St. Lucia is a quaint, civilised place, and anyone coming here must be prepared to put up with minor inconveniences. The best way to look at it is as a prolonged picnic in a beautiful island with a pleasant climate. The Anglo-Indian will be disappointed; there is none of the dignity and glamour of the East; the uncouth though cheerful black is a poor substitute for the grave, courteous Aryan. There is much that is interesting to the historian, the botanist, the geologist, the sanitarian. Fevers, leprosy, malaria, and other tropical diseases can be studied. An eye for beauty, a philosophic disposition, and a sense of humour *suspendens omnia naso*, are not less useful here than elsewhere.



"WET" OR EDEMATOUS FORM OF BEEI-BERI.

A man who illustrates the cases of the edematous variety. On more than one occasion the edema has nearly all disappeared, only to recur again. At the present time he is more swollen than is shown in this photo; his scrotum is an enormous size.

REPORT ON OUTBREAK OF BERI-BERI AMONGST PRISONERS OF WAR AT ST. HELENA.

BY LIEUT.-COL. C. G. D. MOSSE.
Royal Army Medical Corps.

PREVIOUS HISTORY OF BERI-BERI IN ST. HELENA.

CASES of beri-beri have from time to time been admitted to the Civil Hospital in St. Helena from sailing ships calling at the island. Such cases have been of not unfrequent occurrence. I am informed that they more usually come from Norwegian ships, and the popular opinion is that it is because these ships are not as well provisioned as are the ships of other nations and do not carry lime juice.

Cases have been admitted to the Civil Hospital since the arrival of the Boer prisoners in the Island. Five or six were admitted from a Norwegian ship seven or eight months ago—one died and the others recovered. But although the disease has in this manner been imported into the island, it appears to have been entirely confined to the hospital, and, as far as I can ascertain, it has *never* been met with amongst the inhabitants of the Island.

I may add that the Civil Hospital is situated in Jamestown Valley, about three-quarters of a mile from the sea, and is about $5\frac{1}{2}$ to 6 miles distant from Deadwood Camp—1,700 ft. above sea-level—where the outbreak of beri-beri took place.

SOURCE OF THE DISEASE.

My own opinion is that the germ was introduced by the Boer prisoners themselves; possibly some arrived suffering from the disease in a chronic form, and favourable conditions of soil and climate led to a further development and spread of the disease. It is impossible to say which batch of prisoners was responsible for its introduction. I cannot believe that the outbreak has had any connection with cases imported into the Civil Hospital previously noted.

INSANITARY CONDITIONS.

Conditions of camp life associated with the concentration of so many prisoners of dirty habits have probably been favourable to the development of the germ and spread of the disease. Notwithstanding all precautions taken to minimise these adverse conditions, the keeping of this camp in a proper sanitary condition has been

difficult. Extreme hot and dry weather which prevailed during the earlier months of the year accentuated these unfavourable conditions.

FOOD SUPPLY.

The dietary of the prisoners has been ample and excellent, practically the same as that of the troops. Vegetables were for a time difficult to obtain locally, but representations having been made to the War Office on this point, supplies of potatoes and onions have been regularly sent from England by the weekly cattle boats—issued at first twice weekly, latterly four times a week. Whenever fresh vegetables have not been available, compressed vegetables, of which there has been an unlimited supply, have been regularly issued. An abundance of lime juice has been available, and large quantities have from time to time been issued on the recommendation of medical officers. I do not believe that food has had any connection whatever with the outbreak, or troops on similar dietary should have suffered, whereas they have been free from the disease.

CLIMATIC CONDITIONS.

Deadwood Camp is situated on an elevated plateau 1,700 feet above sea-level. East and west of this plateau run deep valleys down to the sea; the plateau, which slopes towards these valleys on either side, is easily drained. The prevailing wind being from south-east, the camp is drained into a ravine to the North-east. The south-east trade winds, to which the camp is much exposed, frequently blow with great force, and bring with them much rain, and the atmosphere generally is damp, but water soon drains off the plateau and the soil does not retain much moisture. But at the time of year when beri-beri was first recognised and began to spread, there had been an unusual spell of very hot and dry weather, with little or no wind; these conditions had continued for about three months, a most unusual state of affairs for St. Helena; the camp ground broke up and became very dusty. It was at this time that enteric fever also broke out at Deadwood. Beri-beri therefore *appeared* to spread during a period of unusual drought and heat, when there was little dampness of air and soil. On the other hand, previous to this period of drought, the camp had very often been exposed to spells of extremely wet and windy weather, and there is no doubt that the disease had existed prior to its having been recognised.

PREDISPOSING AND EXCITING CAUSES.

Mental and physical depression, from which a great many of the prisoners undoubtedly suffered; concentration in a more or less



CASES EXHIBITING THE DIFFERENT PHASES OF BERI-BERI FROM THE ŒDEMATOUS
STAGE TO CONVALESCENCE.

The man on the left of the picture (as one looks at it) shows a case with œdematous and swollen legs.

The man on the right of the picture is illustrative of those cases where the œdema has disappeared, leaving the patient a mere skeleton.

confined area of about 3,500 men of naturally dirty habits ; and exposure at times to much damp and wind, have been the most probable predisposing or exciting causes of the outbreak.

IMMUNITY OF TROOPS.

The immunity of the troops from the disease, though located on camping ground adjacent to that of the Boers, exposed to similar climatic conditions, and partaking of the same dietary, may, I think, be explained as follows :—

(1) The germ, in all probability, was not in their midst.

(2) They were not as much confined to their camp as were the Boers.

(3) They did not suffer from mental and physical depression.

(4) They were of more cleanly habits, and being under more control, their camp could always be kept in a more sanitary condition than that of the Boer prisoners.

NUMBER OF CASES.

Number of cases up to date, 91.

DEATHS.

Number of deaths up to date, 10.

AVERAGE AGE.

Ages of those attacked varied between 25 and 60 ; average age, 35.

VARIETIES OF THE DISEASE.

The varieties noted in text-books have been present during this epidemic, viz., (1) the paralytic (dry variety), (2) dropsical (wet variety), and (3) mixed cases (a combination of 1 and 2). The majority of the cases have been of the dropsical type.

SIGNS AND SYMPTOMS.

Circulatory System.—Affected in most cases. Pain in the epigastric area, with pulsation, sometimes a feeling of faintness. Pulse quick and weak, rapidity of action much increased on exertion. Area of cardiac dulness increased ; heart sounds often follow one another in regular succession, *without any variation in the intervals* ; this is marked in a great many cases but not present in all ; anæmic murmur present in many cases.

Respiratory System.—Breathlessness on exertion usually present. Respirations increased in frequency, and in the worst cases where pleural effusion is present this is very marked.

Digestive System.—Not usually affected. Appetite good. Tongue clean. Bowels normal. Vomiting was noted in two cases, both of which died (probably implication of vagus); this latter symptom would therefore appear of be of bad omen.

Urinary System.—Almost invariably normal. Albumen absent; in one case it was present in small quantity.

Cutaneous System.—General anasarca present in most cases (wet variety) of varying degree, most marked in legs and scrotum, which swell to an enormous size; also present over arms, chest, abdomen, and face in a considerable proportion of cases. The anasarca often appeared quite suddenly and disappeared with equal suddenness. On pressure over an anasarcaous area deep pits are formed, which remain for a considerable time, giving a sensation as if the parts pressed were dough—this is very characteristic.

As a rule no rise of temperature took place. In two cases there was hæmorrhage under the skin, in one case very extensive on the inside of one thigh.

Nervous System.—Signs and symptoms of a peripheral neuritis usually present in greater or less degree. Patients complained of burning in the feet and legs, and numbness. There was anæsthesia of the skin along the front of the shins and on dorsum of feet, also of fingers where these were affected. In the dropsical cases there was often anæsthesia during the height of the dropsy, but when the anasarca disappeared sensation returned.

In paralytic cases the ataxic gait was well marked. Grasp feeble. Absence of knee-jerk and ankle clonus. Knee-jerk was present in a considerable number of the dropsical cases.

Muscular System.—Loss of power, with incoördination of movements most marked in the "dry" cases. Pain—on pressing the gastrocnæmic muscles—was a very marked and constant symptom. In the ataxic cases the muscles waste rapidly, and in the dropsical cases there is marked wasting after the disappearance of the anasarca.

Special Senses.—Sight, hearing, taste and smell all unaffected; the Argyll-Robertson phenomenon absent in all cases.

POINTS OF SPECIAL CLINICAL INTEREST.

The following points in connection with this disease, as it has been observed here, have attracted most attention and appear to be worthy of special notice:—

(1) The *enormous size* to which legs and *scrotum* often attained as a result of the anasarca.



CASES OF "NERVOUS OR DRY" FORM OF BERI-BERI.

The man on the left (looking at the photo) shows a case with loss of power in the hands and fingers.

The man on the right is a case with ataxic symptoms and illustrates the "ankle drop" of right foot.



(2) *Sudden appearance* of the œdema in many cases, and its equally *sudden disappearance*; cases which one day were water-logged would be found twelve or twenty-four hours after almost like skeletons; in some such cases a profuse diuresis had taken place.

(3) Absence of albumen in the urine, and no organic lesion discoverable to account for the anasarca.

(4) Patients invariably bright and cheery, and small amount of discomfort experienced: mind clear all through.

(5) The rapid recovery of many of the purely paralytic cases with ataxic symptoms.

CAUSE OF DEATH.

Death in the majority of cases has been more or less sudden; in such cases evidently due to acute dilatation of the right heart. In two cases rapid effusion into the pleura and pericardium was the immediate cause of death. All deaths which have occurred have been amongst the dropsical (wet) cases; there have been none amongst the purely paralytic (dry) cases.

TREATMENT.

As soon as the disease was recognised all cases were at once removed from the general enclosure and segregated in a separate camp placed on new ground never before occupied, four in each tent, each patient being supplied with a trestle cot and bedding. A generous dietary was allowed, the chief extras given being oatmeal, lime-juice, milk and alcohol.

Drugs found most useful: Tr. ferri perchlor., Potass acet., tr. digitalis, strychnia, nitro-glycerine.

In later cases a number of small punctures made in the scrotum with an aseptic needle has often acted in a wonderful way in drawing fluid from the body generally; the scrotum after puncture is wrapped up in a thick layer of sal-alembroth wool. It would appear that when this treatment is carried out sufficiently early effusion does not take place into the serous cavities.

It was remarkable the improvement which immediately followed the removal of those affected to a more open camp on new ground.

The entire Boer camp having been moved on to new ground and the camp more opened out, the disease did not spread further.

POST-MORTEM APPEARANCES.

In two cases (dropsical variety) rigor mortis not marked; great swelling of the chest, abdomen and extremities from subcutaneous

effusion ; pitting on pressure. On cutting into the skin there was an exudation of thin watery fluid.

Thoracic Cavity.—Both pleural cavities filled with a light yellow fluid ; no evidences of any pleurisy either recent or of old standing ; lungs collapsed, of a pale cream colour, otherwise normal. Pericardium filled with fluid of similar character to that found in the pleural cavities, no evidences of pericarditis. Heart dilated, particularly right side, walls thin, all valves healthy.

Abdominal Cavity.—Much fluid found in the peritoneal cavity similar to that found in the thoracic cavity ; liver, kidneys, and spleen apparently healthy.

THE TREATMENT OF SYPHILIS.

BY LIEUT.-COL. F. J. LAMBKIN.

Royal Army Medical Corps.

OF all diseases mentioned in the nomenclature, there is not one of greater importance to the naval or military surgeon than the one under discussion, viz., syphilis. Taking them as a whole, no disease has been the cause of more invaliding and mortality, either directly or indirectly, than this disease. By its ravages it has rendered armies almost useless, and only a few years ago it was calculated that, in India alone, a force amounting to a whole brigade of British troops was constantly "out of action" through it. But in spite of all this I have always thought that syphilis has not received that degree of attention of which it was deserving, and that it has generally been put in the background, compared with certain other diseases. Take, for instance, two men reporting sick, one with enteric fever, the other with syphilis, which receives the more attention? Undoubtedly the former; special reports, &c., are made about it, whereas, generally speaking, the syphilitic case is regarded as an ordinary slight one, undeserving of any special attention. But, looking calmly at both cases, which is really the more serious? Undoubtedly the syphilitic, for in all probability the enteric case will recover without any bad results, but the syphilitic, if he regains his health temporarily, will probably develop in later life some cerebral, spinal or arterial disease, and die a premature death.

All the world over men of science have, especially during the last twenty years, been seeking fresh knowledge as regards other affections, whereas they have to a great extent neglected syphilis. The treatment of it has made slower progress than that of any other disease, although we know that the surgeon can do more for syphilis than he can for almost any other class of ailment. It is the treatment of this disease which I propose to discuss in this paper.

After having been employed as a remedy for syphilis for over four hundred years, and having passed through various stages in the ups and downs of heated discussions as to its value in the treatment of the disease, I think that at the present time it is acknowledged by the vast majority of the profession that mercury is the true agent to be employed in the endeavour to eradicate the virus of syphilis,

and that without it Nature (in the majority of cases) is unable to expel the specific poison.

In days gone by syphilis was looked upon as almost an incurable disease, but now we know that, given certain conditions, it is quite curable, as far as can be determined by man. Moreover, I think we have evidence that in certain cases even Nature, unassisted, is able to rid herself of the poison, but that when assisted by mercury, given scientifically and for a continuous period, she can certainly cure syphilis. In the treatment of syphilis, the main point to be considered is what method of giving mercury will enable us best to continue treatment over that lengthened period which we know to be absolutely necessary to give our patients a chance of a permanent cure.

Let us consider the methods at our disposal. Firstly, there is internal administration, by which mercury is given by the mouth. Formerly I used to treat all syphilitics in this manner, but I found generally that after the patient had been taking the metal for say three or four months his general health became affected, digestion was interfered with, diarrhoea ensued, and he became cachectic. At this stage the mercury had to be stopped, but even though the man tolerated the drug well, the chances of his taking it regularly, when all symptoms had disappeared, for any considerable time were very remote. Who would suggest giving mixtures, pills, or powders to middle-class patients when at their daily occupations, and expect them to take them regularly and systematically? Who among us cannot recall patients whom we found impossible to treat owing to their forgetting, either deliberately or otherwise, to take their medicine? Long ago I came to the conclusion that it was simply impossible to treat syphilis by the internal method for that length of time which is really necessary to cure it.

Then there is the "inunction method." This is a very old procedure, but it is doubtful whether it has ever been carried out to any great extent in England. Aix-la-Chapelle or Aachen, in Germany, is the "Mecca" of this mode of treating syphilis. There it has been carried out for centuries and in accordance with the following *régime* :—

(1) The patient is advised to rise early and to take a walk to the sulphur spring, about half a mile distant, there drinking a couple of glasses of the natural waters.

(2) After this comes breakfast of a light nature.

(3) From one to two hours later he proceeds to one of the public baths, where he remains immersed in a bath of natural water for not

less than twenty minutes, the temperature of the water being 30° to 35° C.

(4) Half an hour later a professional rubber rubs into the patient's skin 75 grains of mercurial ointment, which is only a trifle weaker than the unguentum hydrarg. (B.P.). The rubbing lasts twenty minutes, and to prevent local irritation the parts of the body rubbed are changed daily, thus, on the first day the ointment is rubbed into the calves, on the second into the thighs, on the third into the back and arms, and on the fourth day into the chest.

The course of the above treatment lasts six weeks. During this time the patient is told to pay strict attention to his teeth, to brush them scrupulously after each meal, and to use frequently a strong astringent mouth-wash, which is ordered for him. He is advised to live well, drink freely of milk; spirits are forbidden, but beer and Rhine wines are allowed. Fresh air and exercise are strongly advised. After this patients are allowed to go away, but are advised to return again within the year for a similar course. I gave this mode of treating syphilis a full trial, and for a long time treated all my syphilitic patients by it, and with great success, but it had certain drawbacks which there was no getting over, as it was almost impossible to carry it out when there was any great number of patients, and it was certainly impossible to continue it once the patient was discharged from hospital; so one had to look elsewhere for a mode of treating the disease, by which treatment could be continued for that lengthened period which we know to be so necessary in order to effect a cure in the fullest sense.

The intramuscular method seemed to fulfil this condition. Since 1890 I have treated all my syphilitic cases by it. During that period I have tried all the solutions of mercury which have from time to time been recommended as injections, viz., perchloride, sal-alembroth, soziodol of mercury, and lastly, but not the least, the metallic mercury in the form of a cream as recommended by Lang, of Vienna, in 1888. Of all these I may say at once that I give preference to the last, and my chief reasons for doing so are:—

(1) It is much less painful (an important fact).

(2) Its effect on the symptoms and on the ultimate cure of syphilis are far more marked than those following the use of other forms of mercury. Why this latter should be is probably due to the fact that the metal is more slowly absorbed than when administered otherwise.

Of recent years I have confined myself almost solely to the injection of the metallic mercury in the form of a cream. The original cream suggested by Lang consisted of equal parts of metallic mercury and lanolin mixed with olive oil in the relative proportions of 4 to 6. I have modified this, first of all using carbolised oil instead of olive oil, and the form I am now using is as follows: Hydrarg., ʒi.; lanolin pur., ʒiii.; parolene carbol., 1 per cent., ʒiv.; of this I give 5m as an injection once a week. The syringe I use is an all-glass one made by Burroughs and Wellcome, of London. It can very easily be rendered aseptic; the needles are of platino-iridium (as steel ones are apt to snap), and can be sterilised without injury. Needles ought to be fixed into metal sockets with solder. When vulcanite sockets are used the needles are only screwed into them, and from the rotatory motion used in driving the needle into the muscle, unless firmly fixed, the needle is liable to unscrew. In giving an intramuscular injection of mercury one thing is absolutely necessary, "the needle must be driven into the muscle itself." The length of needle used is about an inch, this must be sent in its entire length. Before giving an injection the needle must be rendered aseptic, and in introducing it a rotatory motion ought to be used, and the same movement employed when withdrawing it.

As to the question of abscesses following injections, all I can say is that out of some 10,000 injections I have only had one abscess, and I think that this good fortune is due to following strictly the simple rules I have myself laid down. My mode of procedure in carrying out this treatment is as follows:—

- (1) The patient's weight is taken and carefully recorded; this being done at intervals whilst treatment is continued.

- (2) Gums are looked to and teeth are examined, any old stumps being extracted.

- (3) The patient is cautioned to wash his teeth after each meal, and to use frequently a strong mouth-wash of lead and alum whilst under treatment.

- (4) Plenty of open air and a moderate amount of exercise are allowed.

- (5) Spirits are forbidden *in toto*, but wine and beer allowed, together with a liberal diet.

- (6) Patient attends once a week, when he receives an intramuscular injection of 5m of the cream already described. With regard to the weekly injection, I say as a rule the patient gets a weekly injection, but there can and ought to be no hard and fast

rule about this, one must and ought to use one's own discretion. One ought to remember that in giving mercury by this method, one of the great advantages is that we can gauge the amount given far better than when it is given otherwise. Each case ought to be treated on its merits, and the effect of the metal carefully watched. Body weight is a great help as to whether the mercury is doing good, hence the need to weigh frequently. If weight goes down, stop treatment for a month and then resume it. As to the length of time treatment ought to be continued to effect a cure, of course it is impossible to dogmatise, but I think it should be continued, more or less, for at least a year.

Such then, briefly, is the mode of treatment which I have been carrying out since 1890. During this time I have treated many hundred cases of syphilis with the greatest success, far greater than at one time I thought possible. Many of these cases have been published from time to time and records of them have been kept. In the hands of others success has also been attained, whilst a minority have reported against it. Unfortunately, there has never been (with one exception) an official trial given to the method on a large scale, so that comparative statistics could have been available; the treatment has been left in the hands of individuals, who carried it out as they liked or not, but from time to time we have official remarks on it: thus, in the A.M.D. Report for 1894, the Surgeon-General with H.M. Forces in India makes the following remarks:—

“Although the above figures reveal a lamentable prevalence of venereal disease, they do not represent the extent of inefficiency due to ‘secondary syphilis.’ In several stations medical officers adopted the plan of treatment by intramuscular injections of mercury so strongly recommended by Surg.-Capt. Lambkin, A.M.S., and many of the cases so treated were only taken into hospital for a few days at the beginning of the treatment. Most of the medical officers who adopted this plan of treatment reported very favourably concerning it.”

In the Report for 1895 we read: “Intramuscular injections of mercury were again tried with marked success. Intramuscular injections of mercury and lanolin were found to give good results when every other treatment in a very severe case of secondary syphilis had failed.”

In the Report for 1896 we find: “The hypodermic injection of mercury was freely resorted to, with excellent results. This treatment enables many men who would otherwise be in hospital to

perform their usual duties ; it brings the patient more quickly than the old method under the influence of the drug and does not damage digestion. Moreover, the disease yields more readily to the treatment, but is apt to cause somewhat sharp salivation at times."

So again in that for 1898 it is stated that "The practice of continuing treatment after men have been discharged from hospital is favourably reported on from all parts of India. The improvement in appearance and health of the men was generally commented on, and there can be no doubt that it gives the soldier the best chance of having the disease thoroughly eradicated. Part of the reduction of the admission rate was undoubtedly the result of the out-patient treatment, and also greatly lessened loss of service, and was probably the means of considerably reducing the number of men invalided. Most medical officers used the intramuscular injection of mercurial cream in treating their out-patients."

In the last Army Medical Report the following are the remarks of the Principal Medical Officer in India:—

"The practice of keeping men under regular observation, and of continuing treatment in cases of syphilis after the men have been discharged from hospital, has practically become universal, and reports favourable to the system have been received from all parts of India. In the annual reports it is repeatedly remarked that the men under treatment improved greatly in health and appearance. From the statements made in some of the reports there is no doubt that part of the reduction in the invaliding for secondary syphilis and the considerable financial benefit to the State therefrom may be placed to the credit of the out-patient plan of treatment, otherwise the intramuscular method."

Similar comments on this subject were made by the Principal Medical Officer in Egypt, who wrote: "In the autumn of 1899 the General Officer commanding the British Forces in Egypt, Major-General the Hon. R. Talbot, C.B., who even then fully appreciated the special value of this treatment, asked me to apply it to the whole of the army in Egypt." He then proceeds to give some statistics, and from these it is noticeable that admissions to hospital for primary syphilis were reduced from an average of 201 in the four years 1896-1899, to 32 in 1900, when the intramuscular treatment was in vogue, while the average ratio of constantly sick per 1,000 of strength fell from 47·4 to 8·5. The admissions for secondary syphilis gave an average for the four years of 195, against 48 in 1900, and the ratio of constantly sick per 1,000 of strength was 45, as against 12·7 in 1900. Under the head of

"Invaliding for Syphilis," the average for the years 1896 to 1899 was 7·5 per mille, while for the year 1900 it was but 0·01. Early in 1901 a careful inspection of the men in the command was made, and out of 4,000 men only one was found to be unfit for active service owing to syphilis, and he had arrived from England recently in an advanced condition of secondary syphilis.

The same officer ends his report by remarking that the tables for the last two years, 1899 to 1901 (when syphilis was treated by the intramuscular method), show a remarkable diminution of admissions and invaliding for syphilis, unequalled in any command at the time.

The importance of the above experience, with its complete success, cannot be exaggerated. It will result, I hope, in further organised trials being given to the treatment all over the world. Even now, I am in a position to state that this year, in India, an extensive official trial of it has begun. In that country there is unfortunately only too large a field for experiments of this kind, as there, during the last ten years, the army has been almost decimated by syphilis. As to the result of this trial, I have no doubt but that it will prove a huge success under the administration of the present Surgeon-General, as I know that he has the matter very much at heart and is making every effort to lessen the inefficiency of the army in India from this terrible disease.

I would close these somewhat discursive remarks by quoting the last few lines of the concluding paragraph of my original paper on the intramuscular treatment of syphilis, which was published in 1891, wherein I stated that one of my reasons for writing the paper was "In the hope that it may possibly be the means of drawing the attention of the profession, especially that of the Medical Staff of the army, to this treatment, and stimulate them to give it an extended trial. If they will, I feel certain that before long they will discover what a boon it is in the treatment of syphilis, and in the case of the soldier, while they will make his life less of a burden to himself, they will render a great service to their country, by enabling him to give his services to it, and thereby save an enormous expense. At the same time they will lessen considerably the invaliding and death-rates of the army."

I trust that I may not be deemed too presumptuous in thinking that these last remarks have been already partially fulfilled.

HOSPITAL GARDENS.

By LIEUT.-COL. H. L. BATTERSBY.
Royal Army Medical Corps.

THE subject of hospital gardens seems scarcely to have received the attention it merits considering the great difference it would make to the appearance of our hospitals. At present these gardens are too frequently wild, unkempt jungles, without any trace of design or method. Pathways are very frequently of the regular barrack pattern, carriage drives heavily gravelled with coarse rubble, ornamented with huge rocks, well white-washed; flower-beds of no particular design or pattern, which have existed from time immemorial, filled with shrubs and flowers of sorts, mostly of a distinctly hardy nature.

The reason for this state of affairs is partly due to the constant change of the officer in charge of the place. It is not given to everyone to have a taste for ornamental gardening, and even where this is the case, the labours of any individual are in most cases lost or destroyed as soon as his fostering care is removed by some enterprising individual whose zeal is greater than his knowledge of simple garden flowers and roots.

An annual allowance for the benefit of hospital gardens is allotted by the Royal Engineers, the regulations for which will be found in "The Regulations for Engineer Services," paragraph 697. It forms a sub-item of the allowance for incidental repairs to hospitals. This item is not a fixed sum, but is calculated on the average of the preceding three years, and appears to work out at £5 for one-hundred-bedded hospitals and £2 for fifty beds or less. It is quite possible that this sum could be modified considerably, as there are hospitals where a garden may not be possible, while others have extensive grounds. Paragraph 697, Royal Engineers' Regulations, also lays down that all expenses in connection with hospital grounds are defrayed by the Royal Engineers. This is an elastic term, and officers will find that corps are very willing to meet their wishes as far as it can.

The gardener is an important factor, really the most important. Paragraph 274, Regulations Army Medical Services, authorises the employment of one of the hospital establishment as such. As a general rule there are plenty of men who say they are gardeners, in the hope of getting what they suppose to be an easy billet, which it certainly

is, but not quite to the extent of their view of the matter if they are properly looked after. There are men to be found who were gardeners before enlistment, but it does not follow that they are better than anyone else. Any intelligent man will do, provided you can spare the time to instruct him, and he will require a good deal of both time and instruction. My experience is that even with men who are supposed to know a little about gardening, they do more damage than they are worth; they pull up and throw away all roots and plants indiscriminately; this is the reason why you will never see anything in a military hospital of a perennial nature, such as you see in cottage gardens. In the latter you will often see a beautiful garden with all sorts of flowers, which appear in due season, beginning with early snowdrops and ending with chrysanthemums and Michaelmas daisies, plants, in fact, which exist from year to year and cost the owner really nothing.

The garden implements and tools are liberally supplied, and the schedule of equipment is issued yearly with Army Orders.

Gardening cannot be learned from books, and a great deal of information concerning the treatment of seeds, &c., is given on the wrappers in which they are enclosed; but for one who has never turned his attention to the subject a little elementary information is necessary, and when you have become interested in your work more detailed information will be wanted. The elementary knowledge relates to ordinary management, when to plant, when to remove from the ground to houses or sheds, when and how to manure, &c. Books are useful in determining the variety of plants and flowers suitable to your garden, soil and aspect.

There are some useful little books published by Cassell and Co., which are very cheap, but probably the most useful all-round publication that can be found is "The English Flower Garden," by W. Robinson. It is an elaborately designed and illustrated book, and gives all the information that could possibly be wanted on the subject in great detail. The "British Gardener," by Williamson, is a useful book and gives instructions regarding fruit and vegetables as well as horticulture. There are also the handbooks of practical gardening, edited by H. Roberts, published by John Lane, Vigo Street, London; vols. iv. and v., price half-a-crown each, are most useful. Vol. iv., "The Book of Old-Fashioned Flowers," contains all that concerns flowers, gardens, manuring, propagation and gardening operations, month by month, and is cheap, useful and interesting. Vol. v. contains information concerning bulbs, such as snowdrops, crocuses and lilies of all kinds. There are also weekly publications, such as the *Gardener*, *Gardening* and the *Flower Garden*.

It takes quite two years to make a garden, and there are at least two forms of gardens suitable to hospitals, namely, the grass lawn and shrubs, and the flower garden. The first is simple, cheap and easily managed ; it merely requires to have existing lawns cut regularly, all pathways eliminated, except where absolutely necessary, and shrubs planted in some definite design. This system is very effective and can be varied to any extent by planting shrubs and trees, such as azaleas, crab apples, laburnum, thorn, horse chestnut and all the many varieties of pine or juniper, while nothing could look better than well-cared-for grassy slopes and neatly trimmed borders, planted with young trees and shrubs. Once this is done, all that is required is a lawn mower to keep it neat and make it a pleasure to behold.

But beautiful as a lawn may be, I prefer the flower garden, with its great variety of form, colour and perfume, but by this I would not suggest anything very elaborate or expensive. My idea of a flower garden for military hospitals is the cottage variety, and I would divide it into different departments, something in the following style.

Each garden could be divided into a rosary, an herbaceous border, and the flower garden proper, consisting of annuals and perennials. The rosary should, if possible, be specially set apart, and here I would have as an entrance a wire arch with a crimson rambler trained over it, a variety of rose that is very prolific of bloom and improves with years ; then I would arrange the roses in long narrow beds, with a judicious mixture of standard varieties.

The herbaceous border must be arranged with a suitable aspect ; advantage should be taken of the arrangement of the hospital building for this purpose. At the back of the border must come, first of all, tall hollyhocks, these can be had in great variety, single or double, and in all colours, but they require years to come to perfection. In front of these could come some of the following flowers, such as delphiniums, both dark and light blue, planted in clumps, these also require some years to come to perfection ; lilies of all kinds, orange, Madonna, tiger, &c., but all common varieties such as are found in every cottage garden ; then Canterbury bells, &c. All these can be arranged according to the average height they grow, and there is an immense variety of them ; finally, aconites, larkspur, lupins, irises, pæonies, single dahlias, and Japanese anemones may be judiciously utilised to further lend colour and variety.

An herbaceous border has this advantage, that once the plants are put in the ground they require very little care—the less they are disturbed the better they thrive, and they improve by age.

In the flower garden itself, I would commence by forming the beds. As a rule they are too large. A flower-bed should be small enough to allow of its being worked from the edge so as to avoid the necessity of trampling on the mould to work at it, and there should not be too many of them. I would begin by putting in plants which last from year to year, and first of all I would put a border round each bed of crocuses, blue and yellow, with snowdrops in clumps. Iceland poppies require a little trouble to start, but once established last from year to year and are very ornamental. The lawn should be dotted over, not too thickly, with daffodils; these things once put in seem to give little or no trouble, but come up year after year without any further attention.

The subject of annuals is a large one and the choice at our disposal is enormous, but there are certain old-established favourites which no garden can do without, such as dwarf nasturtium and antirrhinum; these latter require two years to grow from seed and last several seasons. Sweet peas sown in clumps, or better still in a hedge about twenty or thirty feet long, should be sown in October for early flowering in the following June. Phlox drummondii is hard to beat, and quantities of mignonette, convolvulus minor, fox-glove and lupins will furnish ample material. There are, of course, a great variety of annuals, which can be found in any florist's catalogue, but they are not easy to propagate except by experts, or at least by some one with experience in that line. But once you have your flowers they are a very useful addition to the wards, they brighten them up, and no doubt exert a beneficial influence on patients, nurses, orderlies and on every one who enters them.

In order to do any good with annuals a series of frames are necessary, as our spring climate is too uncertain for open-air gardening. I once had a rather painful experience in this line; I had a very nice large garden to work upon, and having £5 placed at my disposal, I determined to spend the whole of this sum on seeds and bulbs. I sowed the seeds about the first or second week in April and thought I had nothing more to do, but about the first week in May we had a return of winter and for some weeks there was an Arctic temperature, with a considerable amount of frost and snow, which practically killed off all my seeds before they even sprouted. The dwarf nasturtiums, of which I had a large quantity, showed no signs after many weeks of weary waiting. At length, patience having become exhausted, I wrote to the firm who supplied the seeds, and stated the facts of the case; in reply, they very kindly sent a further supply and expressed an opinion that the early frosts of winter had

killed the first lot. The next thing that happened was a spell of fine weather, when up came all the nasturtiums, so I had a good supply of them that year.

The moral of all this is, that it is impossible to garden without frames and greenhouses. Every garden requires bedding plants, geraniums, petunias, marguerites, &c., which require housing in the winter. There is no place in the average station hospital where this can be done, and without some provision of this kind gardening is wasteful and hopeless.

There is a certain annual allowance of money for hospital gardens, which is generally expended on annual and bedding plants, which make a more or less show in the summer and die off in the winter. This, of course, is wasteful and expensive. If the bedding plants could be housed for the winter they would be strong for the next year, capable of being increased, and a great saving of time and money effected.

The want of garden appliances makes it quite impossible for any officer to do any gardening with any satisfaction or good result, even if he could find the necessary time, or if the tenure of his appointment was sufficiently fixed to admit of his taking the business in hand; besides, everyone cannot be expected to take an interest in the subject. There are many other and probably more useful hobbies. This being so, it appears to me that a satisfactory working arrangement could be effected by giving out the management of hospital gardens to local contractors, and by making the arrangement a yearly one, with power to extend indefinitely according to the satisfaction given.

The present Government allowance I consider ample with ordinary economical management. If, instead of spending it as at present, by handing it over to the officer in charge, to be spent on bedding plants which do not last more than six months and are then thrown on the rubbish heap or burnt, a yearly contract were entered into locally, I think a better result would be obtained. The making of the contract could be varied in various ways, such as giving it locally to districts or by one large contract for the United Kingdom.

I make no claim to have completely discussed in these notes the interesting question of hospital gardens, but possibly their perusal by others may stimulate a greater interest in the subject, which, after all, concerns as much the administrative ability of a senior medical officer as it does the pleasure and comfort of the sick of whom he is in charge.

A NEGLECTED FACTOR IN THE ETIOLOGY OF LUNG COLLAPSE IN EMPYEMA.

By MAJOR HENRY T. BAYLOR.
Royal Army Medical Corps.

ALTHOUGH the causation of lung collapse subsequent to prolonged inflammatory implication of the pleural sac is not a subject about which much obscurity exists, yet we cannot help thinking that the relative importance of the factors concerned in its production has not been hitherto sufficiently defined and emphasised.

Before examining this subject, however, it will be necessary to state that although the points to which we particularly refer may be applicable in a variable degree to every case of purulent accumulation in the pleura, yet it is to those instances of uncomplicated general inflammation of the sac that we especially propose to direct attention.

Suppose we take a case in which the serous exudation has given place to empyema, and that one of the usual methods of drainage, by trochar and cannula, intercostal incision, or resection of rib with insertion of tube, has been applied thereto. Under the most favourable circumstances that may possibly succeed the procedure, we almost invariably find a considerable diminution of the space previously occupied by the lung of the affected side, a consequence generally ascribed to the organisation and subsequent contraction of the fibrinous envelope which the inflammatory process has left on the visceral aspect of the pleura. Although this may be, in the majority of cases, the final cause of the loss of lung area, yet it is not the first or most important element in bringing about the undesirable result of collapse. Where the drainage of an empyema is accomplished by one of the methods mentioned, the withdrawal of the purulent contents is accomplished at a heavy cost, inasmuch as there is no efficient prevention to the entry of air into the sac; and although the importance of avoiding it has long been recognised, and striven against by such various but imperfect methods as those of Benjamin Bell, Easton, Potain, and others, the difficulties to be surmounted in endeavouring to prevent it are so great that its occurrence has been regarded by some writers with a fatalistic complacency as inevitable. But to this fact more than any other is due the lung collapse which we find follows its occurrence. An

examination of the mechanical and physical aspects of the case will prove this.

When the action of the inspiratory apparatus establishes negative pressure within the thorax it is practically impossible to prevent the entry of air to some degree through the parietal opening. This air is not, of course, expelled when expiration takes place, because from its own intrinsic weight the lung tends to spread out at the base, and to fall away from the chest wall at the dome, thereby tending to close the parietal opening (which we presume will be situated not higher than the fifth intercostal space and in or about the mid-axillary line), and consequently cutting off the means of exit of the imprisoned air. As a result, we find that after a time this air begins to accumulate at the apex of the pleural cavity, and is, furthermore, reinforced by the gases which are evolved when decomposition of the pus sets in below. After a time the quantity of air increases to such an extent that it becomes quite impossible for the lung to approach the chest wall in this situation, and up to a certain degree the compression goes on until the lung capacity is considerably curtailed. This condition of things gives rise not only to compression of the lung, which after a time becomes bound down in its diminished area by the fibrinous coat upon it, but it also favours the continuation of the inflammatory process by preventing the approximation of the pleural layers and the obliteration of the peccant cavity. Now it cannot be denied for a moment that the causes which have prevailed to prevent any solution of this difficulty are the mechanical obstacles which debar the possibility of securing efficient drainage, coupled with the fact that at the same time the ingress of air is prevented. And although it may be well-nigh impossible to exclude air entirely after intercostal incision has been effected, yet we think that it might be greatly lessened by due care in the selection of drainage appliances; while, furthermore—and this is the point we wish particularly to enforce—greater attention should be bestowed on the imprisoned air with a view to its removal from the pleural sac.

To this end we would urge that where physical signs admit of no doubt as to the presence of air to any considerable degree in this situation, its occasional removal by means of a Dieulafoy's aspirator is imperatively demanded.

The method to be adopted should be exactly similar to that applied when dealing with a serous infusion, except that the needle will require to be inserted in the second or third intercostal space, and that no receptacle will be required under the delivery tube, inasmuch as it is air and not fluid which is being removed.

The quantity to be extracted will vary, of course, with the amount accumulated, combined with the degree to which organisation of the fibrinous coating on the lung has advanced and permits of expansion of the lung. It is obvious that the aspiration of air should be adopted as early as possible after the signs of the condition declare themselves, for the occurrence of organisation of the lymphoid deposit on the lung to any great extent will render the operation not only more distressing to the patient, but also less likely to be followed by the result aimed at.

If early action on these principles be taken in a case, it will generally be found that five or six charges of an ordinary Dieulafoy syringe may be pumped out before the patient begins to feel a sense of tightness and oppression in the thorax. These are the signs which should guide the operator as to the moment when withdrawal of the air should be suspended.

By the undelayed application of this method the likelihood of adhesion between the layers of the pleura is greatly increased; the respiratory distress is lessened, and the ultimate loss of lung area is considerably diminished.

A MODIFIED "RESTAURANT" SYSTEM OF MESSING.

By LIEUT.-COL. A. F. RUSSELL, C.M.G.

Royal Army Medical Corps.

I HAVE been asked to write a short account of an attempt made to mess the rank and file of the Royal Army Medical Corps at Middelburg, Cape Colony, somewhat on the lines of the "restaurant" system. My account must be very imperfect, as I am home on leave and have no detailed records of the bills of fare for the various meals, and for the same reason I cannot quote the items of the soldier's ration in Middelburg. I am also unable to tell from memory what it cost to purchase the small outfit required for the mess-room.

When the Military Hospital, Middelburg, was formed on its present site, the men lived and messed in bell tents in the ordinary way, and needless to say, they were most uncomfortable. The corporals messed with the sergeants. The first improvement effected was the pitching of two E. P. tents fastened together so as to form a dining hall for the men. All the privates messed in this "hall." The messing was very rough. Each joint was hacked (it could not be termed carving) by the man who happened to be near it. The loaves of bread were treated in the same way. Each person helped himself to butter, and usually left a quantity on his plate. In fact, there was the maximum of waste with the minimum of comfort, and the cooking was indifferent.

When Sergt.-Major Smith, Royal Army Medical Corps, joined the detachment, he discovered that the men were discontented with their way of living, and he recommended to the late Lieut.-Col. Peard, C.M.G., Royal Army Medical Corps, that the corporals should be made to mess with the men. This was done, and the change was an improvement, as the corporals kept the cook up to the mark by seeing that the food was better cooked, and that the teas, soup and hot joints were not tepid or cold when brought to table.

Very soon the Sergt.-Major observed that the corporals sat together at one table and formed a little mess of their own. The corporals were well attended to, but the privates were no better off than before. Lieut.-Col. Peard then gave directions that each corporal was to mess with his own squad. This was the system in

vogue in September, 1903, when I went to Middelburg. The total cost of the messing (without supper) was 5d. per head per diem. There were about 80 men in mess, including a few attached from other corps.

In November, 1903, the Royal Engineers erected six huts for the Royal Army Medical Corps. Each hut was 20 by 40 ft., with a pitched roof and a wooden floor. The walls and roof were formed of sheets of galvanized iron, without a wood lining.

Shortly before the huts were built I had read a paper on the "restaurant" messing of the Army Service Corps at Woolwich, which greatly interested me. I thought one of our huts would make a good dining room, and therefore determined to try a modification of the Woolwich system. The hut nearest to the cook-house was set apart as a mess-room. The men who should have occupied it as a barrack room were accommodated in tents. This was no great hardship, as men can keep in perfect health in tents during hot or dusty weather, provided they have good huts for dining rooms, canteens and recreation rooms. A rule, however, was made that when a man came out of prison, or was awarded a regimental entry, he had to live in a tent, and before long only well-behaved men filled the barrack rooms. As the huts were temporary structures, the Royal Engineers would not make store room, pantries, or counter. They, however, covered one 6 ft. table with zinc. Two 6 ft. tables were placed seven or eight feet from a door in the end of the hut next the kitchen to form a counter. The zinc-covered table was placed on one side of the door and a large cupboard on the other side. Eight 6 ft. tables were arranged in the mess-room as dining tables. A sum of money was taken from the Royal Army Medical Corps canteen funds to purchase an enamelled pint mug for each man, a cruet stand for each table, and a set of carving knives. The dining tables were neatly covered with white American cloth. Two very good lamps were afterwards bought, when it was decided to provide free suppers for the men. The above equipment was all in addition to that already in possession of the men. Two hot water dinner trays (without diet tins) were obtained on loan from the Quarter-Master's store. The following staff was detailed for the mess: one corporal as carver; one private as cook; two privates as "orderly men." The corporal performed corps work in the hospital, and in addition he had general charge of the mess. He carved every joint, and kept the messing book of the detachment. He arranged the bills of fare and obtained the necessary groceries, vegetables, and other extras from the Royal Army Medical Corps.

Regimental Institute. He also superintended the issue of beer at dinner. The duties of the cook call for no remarks. The two orderly men laid the tables, washed the dishes, fetched the food from the kitchen, cut bread and buttered it, and kept the mess-room clean. The essential points of the messing system were that all meat should be carved by an expert carver, and the bread cut into slices and buttered by the orderly men. The first day this was done nearly 25 lbs. of bread in whole loaves, and about 15 lbs. of meat in joints were saved, and yet every man had as much as he wanted of both. The amount of butter saved was remarkable. The surplus meat was served at breakfast or supper, and flour was drawn afterwards in lieu of the excess bread. The flour was used for pies.

The usual routine in the mess-room was as follows: The orderly men laid the tables before breakfast, and cut and buttered the necessary amount of bread. Two good slices of buttered bread were placed on the tables beside every plate. When the men came in each of them went to the counter with his mug and obtained a pint of tea or coffee, and also a supply of cold meat, fish, curry, or whatever was provided for them that morning. Jam and pickles were frequently issued and placed on the counter, and the men helped themselves. Dripping was extensively used. If a man required more bread and butter, or a second helping of anything, he could always get it at the counter. After breakfast the orderly men washed the dishes and prepared the room for dinner.

Dinner was served in a similar manner to breakfast. Pieces of bread were placed beside every plate. The corporal carved, and the slices of meat were placed on the hot water tray. The pots and pans from the kitchen were placed on the zinc-covered table. The men used bowls as soup plates, and mugs as tumblers. The hot water tray kept the carved meat hot for a very long time, so that those men who had to be on duty during the dinner hour always had a hot meal when they were relieved.

Tea was like breakfast, except that only bread and butter or jam was given. By experience it was found that a free supper could be provided for the men for a very trifling sum.

The room was well lighted from 9 to 9.30 p.m., and every man could get a pint of tea, coffee, or cocoa with bread and butter, cheese, meat, fish, potted meat, &c. Of course, only one of these extras was supplied on any one night.

The night duty party dined when the other men had tea, and had a hot meal after midnight. They had breakfast and supper at

the ordinary time. A very decided improvement was effected by not opening the wet canteen until after the dinner hour. A man who has taken one or two pints of beer immediately before dinner has, as a rule, a poor appetite. There was also no temptation to leave the wards and offices during working hours, as there was no canteen to visit. Beer and aerated waters were served at dinner. A man was allowed to have up to two pints of beer. The men gave in their names to the orderly sergeant at breakfast, stating the quantity of beer or minerals they required at dinner. The names were entered in a note book, and at the same time the money for the orders was paid to the orderly sergeant. The orderly sergeant drew the beer and minerals in bulk from the canteen, and issued it in the mess-room to those who had put down their names. It was found that rather less beer was consumed in this way than formerly. The canteen was opened immediately after dinner. The change caused no discontent, and was undoubtedly beneficial to the health of the men. The messing of the detachment was so improved that the men volunteered to pay 6d. per head per month as extra duty pay to the staff. It was, however, not considered advisable to allow this. Attached men said that they had never been so well fed. Extra duty pay was given to the staff from mess funds. The carver and the cook each received £1 per month, and each orderly man 10s. per month. The cost of messing (including free suppers), lighting, and extra pay of staff came to 4·4 pence per head per day in March, 1904. It must be remembered, however, that the "ration" was better than that given at home. The success of the new system of messing was largely due to the constant supervision of all the details by Capt. Sloan, D.S.O., and Sergt.-Major Smith, Royal Army Medical Corps. I cannot speak too highly of their efforts.

The non-commissioned officer in charge of the mess has to be constantly looked after, or he will order large quantities of expensive articles, such as sardines, or the very dearest butter, and so waste money. Officers should check the daily requisitions, and frequently visit the mess-room while meals are being served. They should also take note of how much food is unconsumed, so that if necessary the requisitions may be reduced. The staff should be well paid, or the messing will be a failure. They should have a real interest in making it a success.

It was found at Middelburg that the American cloth on the tables wore well. It gave a bright and clean look to the room. What injures the cloth is the cutting of bread, and this was all done

on the counter. Cruet stands fitted with special bottles are a mistake. The bottles get broken, and cannot be replaced. A cruet stand to hold common round bottles should be selected, and the salt cellars should be separate glass or enamelled dishes. Empty lime juice jars were got for holding drinking water. A jar was provided for each table. They were not satisfactory, as they were difficult to clean, and did not cool the water. In a hot climate large enamelled jugs fitted with taps, and covered with felt, should stand in every mess and barrack room. The jugs should be very wide below and fairly narrow at the top, so that the felt may easily retain the water. The lid should overlap the rim to prevent water entering the jug while the felt is being wetted.

There was no contractor at Middelburg to buy the mess refuse, and of course this was a loss. A couple of young pigs, however, were bought and fed on mess scraps, and I have no doubt but that they will ultimately yield a fair profit.

I may add to my account of the messing that the men only paid 3d. per day per head. The balance was taken from the profits of the Royal Army Medical Corps Regimental Institute.

The experience gained at Middelburg convinces me that in new barracks the dining room for the men should be in the same building as the regimental institute, with counters giving access to both wet and dry canteens. This would greatly economise labour, and enable the men to buy a variety of extras during meal hours.

BILHARZIA DISEASE.

By CAPT. C. B. LAWSON.

Royal Army Medical Corps.

Soon after my arrival at the Royal Herbert Hospital, Woolwich, I was struck by the number of cases suffering from the effects of the parasite *Bilharzia hæmatobia*, and by the uncertainty of its treatment and prognosis. With the kind permission, therefore, of Lieut.-Col. Whitehead, R.A.M.C., the officer in charge of the hospital, and Lieut.-Col. Porter, R.A.M.C., then in charge of the Medical Division, and the valuable aid of Lieut. J. A. Balck, R.A.M.C., and Pte. Black, the laboratory assistant, I set to work to try and throw further light on the subject, especially as to the method of the entrance of the parasite into the body, its treatment, prevention and prognosis, and thereby to help medical boards in arriving at a definite conclusion as to the advisability of the retention in the service of men suffering from the affection, and with a hope of discovering some method of prophylaxis.

History.—I shall only mention the chief facts relating to it. The parasite belongs to the Trematode group (commonly known as flukes); it differs from the other members of the group in being bisexual. It is variously named, *Schistosomum hæmatobium*, *Distomum hæmatobium*, but I think it is best known as *Bilharzia hæmatobia*, the name it is recognised by in the "Nomenclature of Diseases." The affection was once thought to be limited to Africa, but is now known to occur in Cyprus, Sicily, Mesopotamia, and the West Indies. The frequency of hæmaturia in the natives of Egypt and the visitors to that country attracted the attention of Bilharz, who, in 1851, discovered the cause to be a trematode worm, which was subsequently named by Cobbold, in honour of its discoverer, the *Bilharzia hæmatobia*. The most serious cases still occur in Egypt; those from South Africa, except the Rustenberg ones, are mild.

Etiology.—The male worm is white and cylindrical, measuring 11 m.m. to 15 m.m. long by 1 m.m. broad; it possesses an oral and ventral sucker placed close together. The cylindrical appearance is caused by a ventral infolding of the two sides of what is really a flat body. By this infolding a gynæcophoric canal is formed, in which the female is enclosed during coitus. The female worm is brownish or grey in colour, is longer than the male, measuring about 20 m.m., and is more filiform. The genital openings of both sexes face each other, and are immediately posterior to the ventral sucker.

The parasites are chiefly found in the blood of the portal vein and its tributary branches ; also in the vesical, uterine and hæmorrhoidal veins ; in the vena cava, and probably, according to Sonsino, elsewhere in the circulation. This is proved by the finding of the worm in the vitreous humour of the eye, and ova and egg-shells in the heart, lungs and ureters. As the inferior and middle hæmorrhoidal veins are branches of the internal iliac and communicate with the superior hæmorrhoidal (and consequently the portal system) by means of the hæmorrhoidal plexus, it can be seen how the parasite goes further afield than the portal system.

Their number in the veins varies considerably ; 300 have been found in the portal vein and its branches.

The Ovum.—The microscope, with a magnifying power of 50 or 100, shows the female parasite to have its uterus stuffed with ova of a peculiarly characteristic shape, resembling somewhat a lemon pip or Canadian snow-shoe. The eggs are oval, and measure, on an average, 0·16 m.m. in length and 0·06 m.m. in breadth. One end of the ovum is supplied with a short stout point, called the spine, occasionally absent, which is placed either terminally or laterally ; those from the bladder are supposed to possess the terminal spine ; those from the rectum the lateral one ; in my experience the terminal spine is the prevailing form in the rectum, the lateral both in bladder and rectum, but more frequently in the latter. I consider the lateral position to be a deformity caused by irregular pressure during expulsion from the uterus, and occurring more commonly in the rectum, where muscular contractility is capable of exerting more pressure than in the bladder, and so aiding that of the uterus. The function of the spine will be referred to later.

In studying the ova, one notices with a high magnification (about 1,000) some in which the embryo is viable, so to speak ; its cilia are moving gently, and its vascular canals and contractile bodies are working. This is the best time to study the minute anatomy of the embryo, for once the embryo escapes it darts about with such rapidity that careful examination is impossible. I have, however, succeeded in studying the hatched embryo by greatly inhibiting its movements with formalin 1 in 500, but I did not get such a good view as I did when it was viable but not hatched.

The body of the embryo is divided into three parts or zones, a cephalic, a caudal and an intermediate, by the anterior and posterior and coronal apertures and their connecting tubes (fig. 1). The oral aperture may be either at the spine or opposite end of the shell. The body is covered with cilia arranged longitudinally and transversely ; they cease at the base of the oral papilla. These

cilia are often seen in motion even before the embryo is hatched. One row of cilia near the posterior apertures has the peculiarity of frequently standing straight out from the body and vibrating slightly or becoming quite motionless, whilst the other cilia are moving rapidly. All the cilia stand straight out just before the embryo dies; this I have seen on adding formalin 1 in 160 to the fluid containing the embryos. Excretion takes place through lateral apertures; globules and granules are extruded from both anterior and posterior series of these coronal apertures. The body consists of protoplasm, throughout which refractile granules are interspersed. There is a granular membrane between the embryo and its sheath. The size of the space between the embryo and this sheath varies greatly. Shortly before extrusion this space becomes filled with bright granules which have been extruded through the coronal apertures; they show Brownian movement and are often further agitated by the cilia. As the time for hatching approaches, the embryo is seen to move its head from side to side, and draw its body upwards with a jerky movement; this it does by means of the attachment between the front part of the body and adjoining vitelline membrane. No description of the parasite has hitherto stated where the intestine (fig. 1) ends. I succeeded in tracing this in several cases, and find that it does so in a transverse canal running between two posterior coronal apertures. It is impossible to get the ova to hatch in undiluted urine or impure water; they do so readily, however, in urine diluted with distilled water and at a temperature of 60 to 100° F., the normal temperature of the human body being very suitable and that below unsuitable; this is a significant point when the life-span and risk of spread of the parasite is considered. At the lower temperature, or when the embryo is premature, it assumes peculiar shapes, the hour-glass form being the commonest. The hatching time varies, the warmer the air the more readily does it occur, and if the temperature be favourable and the ovum fully matured, rupture occurs within two days. It is very difficult to keep the embryos alive; I have tried to do so in distilled water and blood serum at the body temperature, but they only lived two or three days. This is an important point in connection with the risk of spread of the parasite in fresh surroundings, such as ponds and rivers, in our climate. The empty eggshells have a characteristic appearance and can be readily detected in the urine. The cracks (fig. 2) show where the embryo escaped; it can be seen doing so, and gets free by a combined twist and wriggle. Once free and in suitable surroundings, it darts about and rotates on its long axis; if anything impedes it it slows down and goes through contortions,

at one time bending on itself and at another huddling up into a ball (figs. 5 and 6). The most hardy embryo can be instantly killed by formalin, added so as to make, with the urine, a solution of 1 in 160.

Life History.—Beyond the free-swimming embryo stage little definite is known about its extracorporeal existence. Sonsino believed it to have an intermediate host in some freshwater arthropoda. I see no reason against the ova or embryo being swallowed in water and then gaining access to the portal system through the stomach wall, and then to the general venous system through the portal plexus, as above described.

Mode of Entrance into Human Body.—Regarding this many theories have been advanced, a very prevalent one being that it gains access by the urethra; this has been abandoned for the more likely one of its being swallowed in the drinking of water. I have noticed that the embryo dies quickly if placed in undiluted urine, and I think this is a strong reason against its entering through the urethra. The fact of its having cilia point to its being meant for an aquatic existence. It is too feeble an embryo to be capable of boring its way through the skin, and even if it did get into a sweat or sebaceous duct, it would fare a similar fate to that in the bladder. I know of no instance of either officers, non-commissioned officers, or educated women suffering from the effects of the parasite, although they used the water from various South African rivers for both baths and bathing purposes; but, of course, were careful to avoid getting it into their mouths. I think, therefore, that it enters through the delicate walls of the stomach when the organ is empty, except for the water containing the embryo or ovum, which for reasons above mentioned is more likely to be the clear and more tempting part of the river than the dirty, in which the ova will not hatch or embryos live. The ova would readily hatch soon after the water got raised to body temperature. Once the parasite has gained access to the portal system its life goes on practically, I think, *ad infinitum*; eggs are deposited and hatched, and embryos develop into the mature worm in the veins. Conclusive evidence of this is wanting, but as empty egg-shells have been found in various organs of the body, and the parasite has such a long life-span, it may, I think, safely be presumed. I often wished that I had an opportunity of injecting sterilised water containing a number of ova (previously well washed in sterilised water) into the portal vein of a rabbit and seeing if it developed hæmaturia, and then if ova were found and continued to be found in the urine, any doubt as to its requiring an intermediary host would be removed.

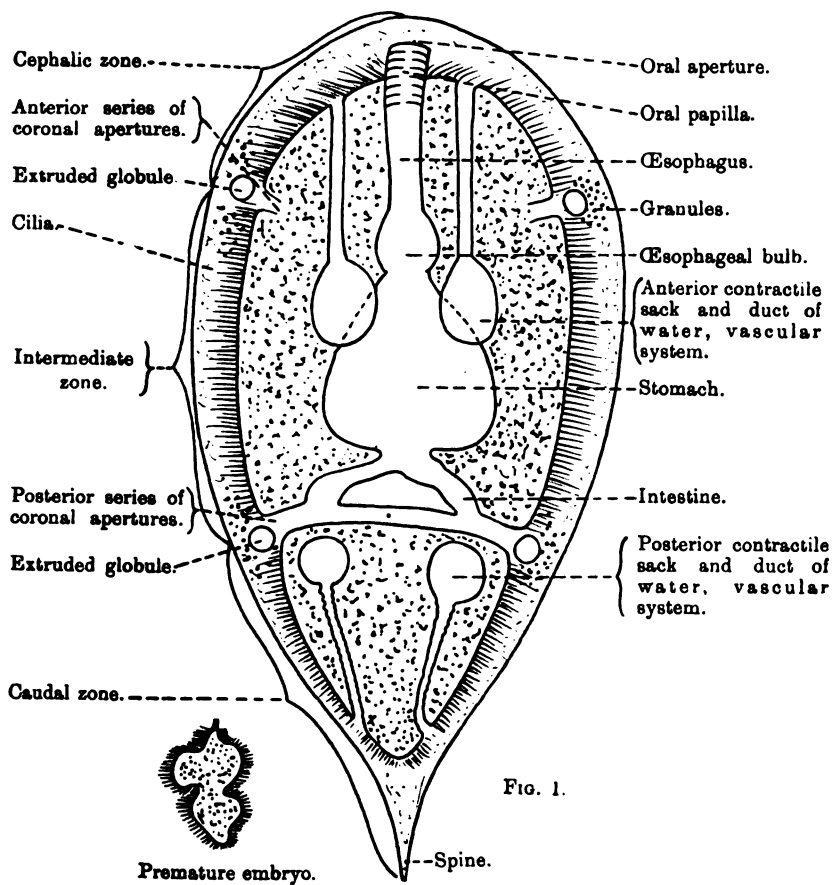
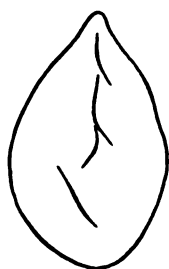


FIG. 1.



Egg-shell.

FIG. 2.

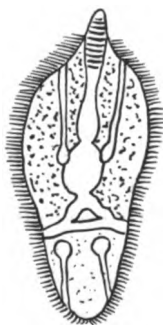


FIG. 3.

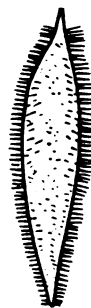


FIG. 4.

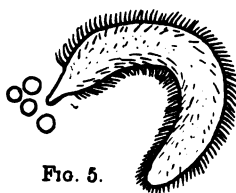


FIG. 5.

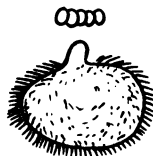


FIG. 6.

OVUM AND EMBRYO FORMS OF *BILHARZIA HÆMATOBIA* (DIAGRAMMATIC).

It might be thought that women might be infected through the semen, which sometimes contains ova, when the disease affects the vesiculæ seminales, but I do not think the embryo would hatch in the vagina, and even if it did, it would die in undiluted urine, so I think there is no risk of infection through the semen.

Mechanism of Entrance of Ova into the Bladder and Rectum.—I think this is as follows: The female makes her way to the hæmorrhoidal plexus, and there gets impacted; the ova are extruded and distend the vein, and eventually a slight papule is produced; this becomes inflamed by, most probably, irritation of the spine, and as more and more eggs are expelled from the uterus, a spine eventually pierces its way through, and there being a *vis a tergo* produced by the pressure of other eggs, it gets pushed on into the cavity of either bladder or rectum, and hæmorrhage, more or less severe, results. A great amount of hæmorrhage cannot occur from any individual papule, because as soon as one egg escapes another takes its place, and when all have got through the venule collapses; but if a number of papules rupture at the same time the bleeding may be severe. Numerous ova is a sign of many positions or parts of the mucous membrane being attacked at the same time, and consequently a more serious form of the disease may be anticipated. Were the female not to go down and get impacted in the venules, I fail to see how the ova could get into the bladder or rectum, as, of course, the venous return is from these cavities, and the ova would not go against the stream. The rent in the papule never heals, but remains as an ulcer which is liable to bleed, especially if great exertion is taken. Fresh batches of eggs may, of course, find their way through the base of the ulcer and give rise to a recurrence of hæmorrhage by opening up the communication with the vein. Riding, which tends to congest the hæmorrhoidal and vesical veins, is very apt to cause a recurrence of hæmorrhage. The ova are chiefly deposited in the submucous coat of the bladder and rectum; less extensively in the mucosa, and still less so in the muscular wall or subserous connective tissue. Sometimes calcification occurs round the ova while they are in the tissues, and phosphatic deposits containing ova also are occasionally found. Various forms of polypoid excrescences are found extruding from the bladder mucous membrane; these may contain the adult parasite; detached portions of these growths should, therefore, be carefully examined, as it is very rarely that the adult worm is found in the urine.

All the coats of the bladder may be thickened and also the ureters, especially at their termination. Obstruction of the ureters

may arise from impaction of small calculi containing ova or thickening of the mucous membrane, and so hydronephrosis, pyelitis, abscess of kidney, and similar secondary affections may arise. The vesiculæ seminales may be affected, and also the walls of the vagina and the cervix uteri, leading to sanguineous discharges containing ova. Polypoid growths also occur in the lower part of the rectum and resemble piles, and when removed are found to contain ova. Tumours of bilharzial origin have sometimes been found in connection with the peritoneum and ligaments of the uterus. *Blood examination* shows an eosinophilia.

Incubation Period.—The period that elapses between infection and the appearance of ova in the urine is variable, but never, in the cases I examined, less than four months.

Symptoms.—These vary widely in degree. Sometimes the patient experiences no trouble; other cases suffer greatly. The most characteristic symptom of its presence in the bladder wall is hæmaturia, which is most marked towards the end of micturition, and may be accompanied by a sense of urinary irritation.

The amount of blood varies from a few drops to a considerable quantity of pure blood. Any cause which aggravates cystitis increases the hæmorrhage, such as exercise, especially running or riding; also dietetic indiscretions. The South African variety is as a rule mild; the more severe cases came from Rustenberg. Egyptian cases are more severe. After the condition has lasted some time cystitis supervenes, and may cause a good deal of suffering. The ova may form a nucleus for vesical calculi. Papilloma may also form in the bladder, the result of irritation. Spermatorrhœa, with ova in the semen, occurs occasionally. The kidneys and ureters may also get affected.

The cases of severe infection lead to anæmia, wasting and debility. Most of the cases I studied were mild, and the patients suffered no inconvenience, and reported that it was when they marched long distances or trotted much that the hæmorrhage became pronounced.

When the rectum is involved dysenteric symptoms may supervene. Surg.-Gen. Keogh, C.B., was amongst the first to point this out in connection with the differential diagnosis and treatment of dysentery. Condyloma-like growths may form round the anus; these are full of ova.

Milton (*Journal of Tropical Medicine*, June 2nd, 1902) has recently pointed out the extreme frequency of urinary fistula of bilharzial disease of the urethra. The fistulæ may occur anywhere in the neighbourhood of the genitals, but are specially common in the

perineum and posterior surface of the scrotum, the result of infection of the urethra just in front of the bulb, the eggs being deposited in the mucous or submucous tissue. Urethral strictures may also occur.

Diagnosis.—Once suspected this is easy; a magnification of about 100, a small opening in the diaphragm, and the condenser turned down, shows them best. Cases have been invalided as dysentery and Bright's disease. The mischief caused by the parasite may remain when the ova have practically disappeared; the centrifuge will, however, reveal them in such cases. While at Woolwich I was asked to see an officer's groom, who was suffering from obscure symptoms, thought to be due to chronic nephritis. On going into his history, I found he had served in Egypt in 1885, and had while there noticed his urine to be "red." I examined his urine, and found blood and ova; he had taken some severe riding lessons shortly before his attack of pain in the back, which he attributed to a chill. He had not been abroad since 1885.

Treatment.—There is no known means, direct or indirect, by which the parasite can be destroyed in the human body. The situations it occupies make it secure; palliative measures are practically the only ones that can be adopted, and are those for chronic cystitis. Rest is essential. Riding is especially hurtful. From my observations on the effect of methylene blue, male fern and santonin, I am convinced that they are useless as a cure for the disease, but they (except the santonin) may control the hæmorrhage. Excessive catarrh of the bladder I treated on the usual lines. Urotropine, while useful in cystitis as a urinary antiseptic, had no effect except this—the ova would not hatch; this, I suppose, was because it leads to the excretion of formaldehyde in the urine, and formalin, which is so deadly to the embryos, is the commercial name for 40 per cent. solution of formaldehyde. Salol, benzoic acid, sandal wood, bucher and other urinary sedatives and disinfectants find their place in the symptomatic treatment of the affection. For calculi and fistulæ operative interference is necessary. Mackie and others have performed perineal cystotomy and drainage in severe cases of cystitis. Rectal polypoid growths should be removed if accessible. Hyperplasia of vagina and cervix is best treated by scraping.

Prophylaxis.—Although nothing can be done to cure the disease, it is, I think, easily preventable, and this may be accomplished by the following measures:—

- (1) The urine and stools of those suffering from the affection

should be destroyed in a destructor, if one be available, or rendered harmless by the use of antiseptic or disinfectant fluids. On making a series of experiments with various disinfectants, I found that the one which most readily destroyed the embryo and which prevented them being hatched was formalin; it instantly kills embryos in a solution of 1 in 160 or 1 in 300; 1 in 8,000 perchloride of mercury, or 1 in 160 carbolic, does not do so; these, however, do so in strong solutions, as 1 in 1,000 and 1 in 20; but even then not so readily as formalin, the reason being that the urine and fæces contain albumen, owing to the presence of blood, and so a protecting sheath of coagulated albumen forms round the ova and prevents the action of these disinfectants. Izal in 5 per cent. is a good destroyer, but rather slow in its action, half an hour being necessary.

(2) The ova should be prevented from getting into drinking-water by efficient drainage, and the inhabitants cautioned against micturating or defæcating into or near a river, lake, pond or other freshwater source.

(3) Drinking water should either be boiled or efficiently filtered, and children should be warned against drinking from ponds, streams, or canals.

(4) No uncooked vegetables which have grown in infected districts should be used as food.

(5) Bathers should be careful to avoid drinking, or even taking water into their mouths, while bathing.

Danger of Spread at Home.—The modern methods of sewage removal and disposal and water supply preclude all chances of its spread in urban districts, but it is possible it might do so in rural parts, especially in warm weather.

Prognosis.—Taking in consideration the long life of the parasite—even eighteen years, as in the case I mentioned above—and that there is no known remedy, the prognosis as regards the duration is bad, but as a rule life is not much endangered, except in some cases occurring in Egypt. The more ova the worse the prognosis. I fear that all soldiers who have contracted the disease are, when cystitis has developed, permanently unfitted for the service; I think this is obvious when the fact that running and riding or even marching for any distance is almost sure to cause a recurrence of the hæmaturia. The chance, also, of renal disease, urinary fistulæ and calculi occurring must be considered.

Insurance companies will not accept cases suffering from the disease. In fact the disease may be looked upon as a chronic cystitis with an irremovable cause.

WITH THE THIBET MISSION FORCE.

BY MAJOR A. R. ALDRIDGE.

Royal Army Medical Corps.

ALTHOUGH the Thibet Mission Force is a small one, the physical conditions of the country and the long lines of communication present features of some complexity for the medical as well as for the supply and transport branches.

For a fighting force of some 5,000 men no less than 10,000 persons are employed on the lines of communication. Mule, pony and bullock corps drivers enlisted in India, and coolies from Baltestan, Poonah, Nepal, Sikkim and Thibet, are scattered over a line extending over 200 miles. From the Teesta valley—one of the most malarious tracts in India—it runs through Sikkim, in parts of which the rainfall reaches 300 inches a year, over the Nathu La Pass, 14,500 feet above the sea, and on for 120 miles over the Thibetan *plateau* to Gyantse.

The medical treatment of all these necessitates a somewhat elaborate system of hospitals, and many of these, in a country where, at this time of year, tents are useless for the purpose on account of the heavy rainfall. Luckily in these parts the bamboo is plentiful, and very satisfactory huts, constructed from floor to roof entirely of bamboo, are run up in a very short time.

I have heard of two cases of what appears to be genuine black-water fever in the Teesta Valley, and malarial fever is still very prevalent among those who were in the valley last autumn. Dysentery also disables a considerable number on the line south of the Nathu La. Cholera has recently shown itself at a number of points, though at only two places have there been definite outbreaks, and these have been confined to grass-cutting coolies and other inhabitants, the troops and followers having, so far, escaped. In a country where springs, streams and rivers are so abundant, it is no easy matter to ensure that men so regardless of the quality of the water they drink shall take it only from a safe source; but here again the bamboo comes to our aid; and with bamboo piping, at some fifteen or twenty posts, water has been brought right into the camp from a safe distance, and at very small labour and cost, for here, as in most cases on service, the difficulty is not so much to find a safe source, as to prevent its being contaminated by the troops and followers themselves.

The transporting of sick to the base quickly enough to prevent overpowering of the single sections of field hospitals, arranged along the line at intervals of about forty miles, is no easy matter. Only as far as Guntok, about sixty miles, is there a cart road, and though ambulance tongas are used on this, the state of the road makes it far from a pleasure to ride in them. Over the Nathu La, for a distance of some eight miles, neither riding ponies nor the regulation dandy are possible, and we are met by the still unsolved problem of a suitable means of transport for hilly countries. Different forms of improvised stretchers and hammocks are being tried. From Gyantse to the Nathu La both ponies and dandies can be used, but when it is remembered that one day's feed for an animal at Gyantse has cost about seven shillings, it can be understood that they are none too plentiful, and as the hospitals have been sent without their complement, they have to be obtained when possible from the general transport.

SPORT IN KISHTWAR.

BY CAPT. E. T. F. BIRRELL.

Royal Army Medical Corps.

IN June, 1903, I was shooting in Kishtwar in the Maharajah of Kashmir's territory. My camp was near the crest of a horse-shoe-shaped hill, the inner face of which was bare, precipitous cliffs, steep grass slopes, and here and there scrub jungle. The other side was mostly well-wooded with deodar and pine. Tahr, gooral and a few red bear inhabited the inner face, while the wooded lower slopes of the other side held numerous black bear. Musk deer were very common.

The sport was good, but of all the game the tahr (*Hemitagus Junlaicus*) gave the best sport and required the most care in stalking. At that season they had none of the long shaggy coat they carry in winter and early summer, but were quite short haired, with no fringe on the neck. We had seen two herds on very bad ground towards the northern end of the horse-shoe, and I had succeeded in getting some fair heads out of one, but those that seemed the largest were on ground that looked inaccessible, and never came on to reasonable ground till late in the evenings.

Twice we had to give them up, being too far off when found to get at, until one morning when we scrambled up to where they lay in their scrub and long grass. Unfortunately one jumped up close to us from a hollow where he was lying up, and got away, taking the herd with him, round the hill out of sight. The ground was so bad and the covert so thick we could not follow in time to see where they had gone. However, there was a steep cliff in the direction they had taken, where we had seen them on other days, so we awaited developments, breakfasting meantime. At last, about 2 o'clock, two or more tahr appeared on the cliff; the telescope showed them to be shootable heads, and I decided to have another try.

To get there we had a very difficult scramble along the hillside till we struck a small rocky nullah leading into the large nullah at the bottom of the cliff where the beasts had been seen. Slowly we crawled down to near the mouth of the small nullah, then crossed it and climbed up the opposite side, so as to look over into the big nullah. Just as we were getting to the edge up jumped a big tahr within a few feet of me, and went off with

a clatter. There was no time to lose, so scrambling up as fast as I could, I got into a position commanding the cliff and most of the nullah. At first no signs of a tahr, then I heard one whistling in alarm quite close; he stepped out about twenty yards off on the edge of a precipice and was immediately saluted with a shot through the shoulder which knocked him off into space.

Then tahr appeared from all sides; grey bodies dashing about in alarm. Evidently we had stalked into a sleeping herd, and they could not make out where the danger was. I saw fine buck making off, and had several shots at the blackest looking; but they were all rather far off, and kept running and stopping in the most disconcerting way for me after my climb; I had no success, and at last they all seemed to have cleared off. I had lit my pipe and was taking it easy, when the "shikarri" pointed me out a tahr on the opposite cliff, about 200 yards away, across the nullah. By this time my hand was steady, and seeing by the telescope that he had a decent head, I took a steady pot shot at his grey back as he stood almost vertical on the face of the cliff. The first shot went above him, but a second was more successful, and he went hurtling down on to the rocks below. Then the village "shikarri" was armed with a knife, and went down to bring up the heads. Both beasts were of course stone dead—greatly to the man's regret—the right horn of the first was broken off short, and the skulls of both smashed to pieces. One measured eleven and the other eleven and a half inches; only fair heads, and rather disappointing after so much hard work.

Then came the long climb back to camp, which we reached about 9 o'clock, with the help of lanterns and torches sent out to meet us. Later on I got tahr with better heads, but this was the only day in which we succeeded in following them up and circumventing them in their sleeping quarters.

REPORT ON A SERIES OF CASES OF SYPHILIS TREATED
BY INTRAMUSCULAR INJECTION OF MERCURY,
ON THE HOSPITAL SHIP "MEANEE," HONG KONG.

By CAPT. L. E. L. PARKER.

Royal Army Medical Corps.

THE number of cases of syphilis occurring amongst the troops in Hong Kong is not very large, owing to the precautions for the prevention of venereal diseases taken by the local authorities. The cases mentioned below were the only ones known to have occurred in the garrison from December 7, 1902, to June 6, 1903, a period of six months.

All cases were treated on the same lines by intramuscular injection of metallic mercury suspended by means of lanoline. In all cases, except one, recovery was rapid and unattended by any complications. In not a single case was there any sign of inflammation or tendency to abscess formation. The operation, beyond the prick of the needle, was painless.

As a rule four injections, with intervals of a week between each, were sufficient to remove all traces of the disease, to the outward eye. Plaques and mucous patches disappeared, rash began to fade immediately, and in a month's time the men were, to all appearance, well and in better condition of general health than on admission. All the cases increased in weight and lost their anæmic appearance. Most of the cases had suffered, at some time or other, from malarial fever, and in a few it recurred at intervals, but in spite of this they continued to make good progress. Men stationed in Hong Kong, who have suffered from malaria to any extent and are anæmic, often have a tendency to sore and spongy gums. In two of these cases this condition became slightly aggravated, and the injections were suspended for a time and resumed later. In these cases of syphilitic patients, affected also with malaria, special watch should be kept on the condition of the mouth, and the injections suspended for a time if necessary.

The first two of these cases were injected with a cream made according to the prescription of Lieut.-Col. Lambkin, R.A.M.C., consisting of—

Mercury	..	..	..	..	..	..	3ii.
Lanoline pur. anyhd.	..	..	..	..	..	..	3ii.
Carbolic oil, 5 per cent.	..	..	..	..	..	..	3iv.
5 to 10 minims once a week for injection.							

As the weather was cold, and it was difficult to keep this preparation sufficiently fluid to be taken up by the syringe without heating, I tried, at Lieut.-Col. Lambkin's request, a cream composed of—

Mercury	..	..	..	..	..	..	5ii.
Lanoline pur. anhyd.	..	..	..	..	..	..	5ii.
Parolein carbol., 2 per cent.	..	..	..	..	..	..	5iv.

This preparation (used in the same manner as the first) kept sufficiently liquid to be taken up by the syringe at any time. It is, however, only suitable for use in cool weather, or in a temperate climate; in hot weather it becomes too liquid, and the mercury is not kept in suspension.

The routine observed was as follows: On admission the mouth and gums of each case was inspected and put in as good condition as possible. Each patient was provided with a tooth-brush and tin of tooth powder, which he used after every meal, under the observation of the ward-master. A mouth-wash of acetate of lead and alum, aa grs. iii., ad. ʒi., was also used regularly. The patients were put on a good diet, and in most cases, during the winter, a bottle of stout *per diem* was allowed.

The injection was made once a week, the right and left buttock being selected alternately. Before injection the buttock was cleaned with soap and water and carbolic lotion, 1 in 20. The needle, after having been boiled, was driven straight into the muscular tissue, then withdrawn a little and the injection slowly made. Five to ten minims of the cream were injected. No pain or induration followed in any case. A brief synopsis of the cases is given, with the number of injections in each.

CASE 1.—Of some slight interest, as the patient denied having ever had a chancre. The eruption was not typical, and he was under treatment for a time for eczema, but showed no improvement. On further examination enlargement of the cervical glands was observed and he was put on treatment. Immediate improvement followed. By the time the third injection was due the eruption had practically disappeared and was absent when the fourth was given. Discharged, to attend three weeks after first injection.

CASE 2.—This case was admitted with a very bad sloughing chancre, which had perforated the prepuce on the dorsal side. He was very anæmic and debilitated, and had recently been in hospital with malaria. He received an injection at once, and the penis was steeped in hot boric lotion. The sloughing stopped on the second day and repair at once commenced and continued without

interruption. In a fortnight the chancre had healed entirely, though there was a perforation of the prepuce about the size of a cedar pencil, which will be permanent. He improved a great deal and increased 6 lbs. in weight. Three injections before discharge from hospital.

CASE 3.—An ordinary case, but the gums were spongy and became worse for a time. Two injections were given, then none for a month. He then had two more, and was discharged.

CASE 4.—Ordinary. Four injections.

CASE 5.—Ordinary. Five injections.

CASE 6.—Ordinary. Four injections, with an interval of three weeks between first two and last two, as his gums were spongy.

CASE 7.—Ordinary. Four injections.

CASE 8.—Ordinary. Three injections.

CASE 9.—Ordinary. Four injections.

CASE 10.—Severe. Eight injections.

CASE 11.—Ordinary. Two injections.

CASE 12.—Ordinary. Three injections.

CASE 13.—Ordinary. Four injections.

CASE 14.—Ordinary. Two injections. This case was readmitted and received two more injections.

CASE 15.—Ordinary. Four injections.

CASE 16.—Under treatment. Four injections.

CASE 17.—Under treatment. Four injections.

CASE 18.—Under treatment. Four injections.

Only one of these cases has been readmitted to hospital for syphilis. There has been no case invalidated during this period. After being discharged from hospital the men attend weekly for injection, performing their usual duties at the same time. The average number of days in hospital per man was thirty-two. Most cases were in hospital less time than this, but a few severe cases bring the average up.

The following note was made about six months later: I should like to have been able to describe the after-history of these cases, but can only give their history as regards readmission to hospital. Although some of the cases were first put on treatment over a year ago, up to the present none have been readmitted to hospital for syphilis, except one case, No. 14, who returned for a short time. This, I think, is a fair test. One case of syphilis is to be invalidated this winter. This was a very severe case of rupia in a weak and anæmic subject. He has improved very considerably under treatment.

A table is appended giving the date of admission, date of first injection, and date of discharge from hospital.

TABLE.

Number of Cases	Admission	First Injection	Discharge
1	December 26, 1902 ..	December 27, 1902 ..	January 16, 1903.
2	" 16, " ..	" 21, " ..	" 6, "
3	" 10, " ..	" 21, " ..	" 13, "
4	January 5, 1903 ..	January 8, 1903 ..	February 23, "
5	February 4, " ..	February 9, " ..	March 4, "
6	" 14, " ..	" 14, " ..	" 2, "
7	" 23, " ..	" 23, " ..	" 20, "
8	March 17, " ..	March 22, " ..	June 18, "
9	April 17, " ..	April 17, " ..	April 28, "
10	" 25, " ..	" 27, " ..	May 16, "
11	May 1, " ..	May 2, " ..	" 26, "
12	April 21, " ..	April 26, " ..	" 18, "
13	May 27, " ..	May 28, " ..	June 19, "
14	" 27, " ..	" 28, " ..	" 15, "
15	April 21, " ..	" 25, " ..	" 11, "
16	June 6, " ..	June 6, " ..	{ In hospital, awaiting transfer as invalid.
17	" 3, " ..	" 5, " ..	September 8, 1903.
18	" 2, " ..	" 5, " ..	July 7, "

AN EXPERIMENT IN CONSERVANCY.

BY LIEUT.-COL. H. K. ALLPORT.

Royal Army Medical Corps.

FEELING very strongly the necessity for a safer and cleaner method of conservancy in this country (India), and being convinced of the failure of the dry-earth system, I have been led to make the experiment which is here recorded. The method had previously been tried on a very much smaller scale and found clean and easy to manage. The effort is especially directed against the continued spread of enteric fever among our troops in India. As the question of cost is important, no initial expense was incurred.

A latrine of seven seats was selected in the Station Hospital and the dry earth removed from it. Into each pan was put 24 ozs. of mercuric chloride solution (1 in 4,000); this covered the bottom and sloping sides of the pans for two inches. The pans were cleaned twice a day, and the solution renewed. This was continued for two months, with the result that the latrine was the best kept in hospital. Flies disappeared; there was no perceptible smell, and no dust. The deposits were covered by the fluid. The latrine sweepers emptied the pans directly into the Crowley cart, instead of into the receptacle in the cleaning passage, thus avoiding much handling and getting rid of the receptacle altogether. The working of the latrine was found to be simpler and cleaner than by the dry-earth method. An important consideration is the lessening of labour and handling. Good sweepers are difficult to obtain, and become discouraged by being constantly checked for neglect of their latrines, which is largely due to the intricacies of the dry-earth procedure and carelessness of the soldier. The sweepers liked the wet system, and there was never occasion to find fault.

If a wet system were substituted there would be greater cleanliness and an absence of dust. Now, a sort of mud is formed by the mixture of earth with other matters; this mud sticks to everything it touches; it is washed away by rain, then dries, and is blown about by wind as dust, or carried about by the sweepers' hands and clothing. You have only to trace the outgoings of persons and things from the latrine to immediately realise how wide the circle of possible infection may be.

Facts and arguments could be multiplied, but each sanitary officer, however wide or narrow his scope of observation, can see these for himself. The undoubted deodorant property of earth must be set aside; we allow ourselves to be blinded to the real danger; what is wanted is disinfection *on the spot*. Nitrification that may take place in the earth outside the station does not prevent infection in barracks.

If applied on a larger scale, concentrated solution of perchloride of mercury, coloured blue, would be supplied to latrines and diluted under supervision. Receptacles would be got rid of, and the pans emptied twice a day directly into the carts, which would stand behind the latrine. The solution could be used for disinfecting any part of the latrine or its belongings.

The plant at present in use will be available and the same establishment required, but the work will be easier and cleaner. The objections that I see are: (1) Poisonous properties of the solution; this may be neglected if suitable precautions are taken. (2) Increased cost to Government. My two months' working cost 8 annas a month; there will be no initial outlay required. The price of perchloride of mercury is Rs. 4 per lb.; 2 ozs. 48 grs. were used to make the solution for one month in the latrine of seven seats: value, annas 8.

Take the number of troops as 70,000; one seat to fifteen men gives 4,666 seats; dividing by 7 (the number of seats experimented on) gives 666 latrines of seven seats each at 8 annas per month, equal to a total cost of Rs. 333. This trifling expenditure would compare favourably with the present loss of money and efficiency from enteric, even if a slight diminution in the number of cases were the result.

I am assuming the efficiency of the means suggested against enteric: this could be fully tested by applying the method on a large scale to a station, or group of stations, and watching the results. I have shown that it is a cleanly, easily applied, and inexpensive system of working barrack latrines. Smell is not increased by withdrawing dry earth, and it is admitted that the disinfectant properties of the perchloride are superior to those of earth. A great advantage is gained by substituting water for earth, rendering all the cleaning processes easier and simpler, and getting rid of mud, which is really what the dry-earth method comes to in actual practice.

THE FREQUENCY OF FRACTURE OR OF DISLOCATION OF ONE OR MORE OF THE PROXIMAL ROW OF CARPAL BONES.

By W. S. HAUGHTON, M.D.

*Surgeon Steevens' Hospital and University Demonstrator in Röntgen
Photography, T.C.D.*

AND MAJOR M. P. HOLT.

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PROBABLY nowhere is accurate skiagraphy, or what is still more imperative, accurate *reading* of skiagrams, of more importance than in connection with injuries about the wrist joint. The term "sprained wrist" has long been used to cover a multitude of unrecognised and inaccurately diagnosed injuries, with a not uncommon sequel of permanent impairment of function of the joint. The cases quoted below have been met with by us during the past year or so, not a few of them had been "badly missed" (to make use of a phrase suggested to one of us) whilst in other hands, and a close scrutiny of the skiagrams of some of the earlier cases led us quite independently to similar conclusions, and on comparing notes it became obvious that these cases could not be regarded as mere coincidences or singular rarities. The text-books almost unanimously describe either fracture or dislocation of one or more carpal bones as matters of "extreme rarity," and as such proceed to relegate them to the region of curiosities; but the fact that so many instances have come into our hands within so short a period, neither of us having a more extensive "accident practice" than that which a general hospital brings, compels a revision of present opinion; and we would even venture so far as to insist that—firstly, with a history of recent injury followed by extreme pain on attempted movement, but with possibly no obvious deformity; or secondly, with a history of old injury followed by permanent more or less complete impairment of function with probably still no loss of normal outline—there will be found in almost all cases either fracture, or more or less complete dislocation of one or more carpal bones. The most common injury appears to be fracture of the scaphoid bone; the fragments may be more or less displaced or may be rotated about a longitudinal or transverse axis; the bone may be simply fractured across its constricted por-

tion, or may be extensively comminuted. In one case permanent fixation of the joint was found to be due to comminution, and subsequent callus formation, of the semilunar bone. Dislocation forwards of one or more of the proximal row of carpal bones is not very uncommon; the displaced bone then lies amongst the flexor tendons, and in that position prevents either active or passive flexion of the wrist-joint, and in one case produced marked pressure symptoms on the median nerve. The mechanics of the disability are sufficiently obvious to account for the resistance to flexion, experienced even under full anæsthesia. In cases of fracture crepitus may usually be obtained with care, especially under an anæsthetic.

The form of violence necessary to produce these injuries is not necessarily extreme, and in nature may vary widely. Amongst our cases were instances of (a) falls on the hand or extended wrist; (b) direct violence; (c) blow on the knuckles; (d) forcible hyper-extension of the wrist-joint; (e) severe traction on a rope encircling the joint; (f) hyper-adduction.

For incontestable diagnosis careful skiagraphy is an absolute necessity, and we suggest that in all cases presenting any difficulty in *reading*, stereoscopic skiagrams must be taken; further, that lateral (radio-ulnar), in addition to the usual antero-posterior views, will leave not a possibility of doubt as to the presence or absence of dislocation, and cannot under any circumstances be considered "unnecessary," a "waste of time or of plates," as has been more than once suggested to us; we would go further and insist that in all cases the two limbs, sound as well as damaged, should be shown on the same plate. To clear up doubtful cases we have sometimes found it of the greatest advantage to take the two wrists in the following positions, viz. (1) both prone (palms to plate); (2) both fully supinated (dorsum to plate); (3) both semi-prone (palms together and ulnar borders to plate). Even a fourth position, both fully pronated (backs together with radial borders to plate), has been found to complete evidence of the nature of the injury.

In order to acquire a good working knowledge of the skiagraphic appearances of the normal wrist-joint in the usual extended position, it is necessary to study very attentively plates of several different pairs of wrists taken in each of the above positions; the variations in the normal scaphoid alone will repay the trouble. In tall persons, in short, in muscular, in delicate, will be found variations which will convey considerable information: thus, the scaphoid in a very

tall delicate woman will appear much like a simple cylinder with its long axis almost coincident with that of the forearm, whereas that of an unusually muscular, short, thick-set man, will present a "waist" which to the uninitiated may at first resemble fracture, and its long axis will be nearly transverse to the length of the limb, it may even appear to be doubled upon itself; these variations will puzzle the casual observer severely, and easily lead to erroneous diagnosis. Again, the point of view from which the skiagram is taken will produce most widely different appearances; on the one hand that of a normal bone may simulate fracture, and on the other a real fracture may be overlooked by reason of the path of the rays not having passed along the line of fracture. In this respect compare Lynn Thomas's remarks on fracture of the styloid process of the ulna being overlooked owing to this cause.—(*Archiv of Skiagraphy*.)

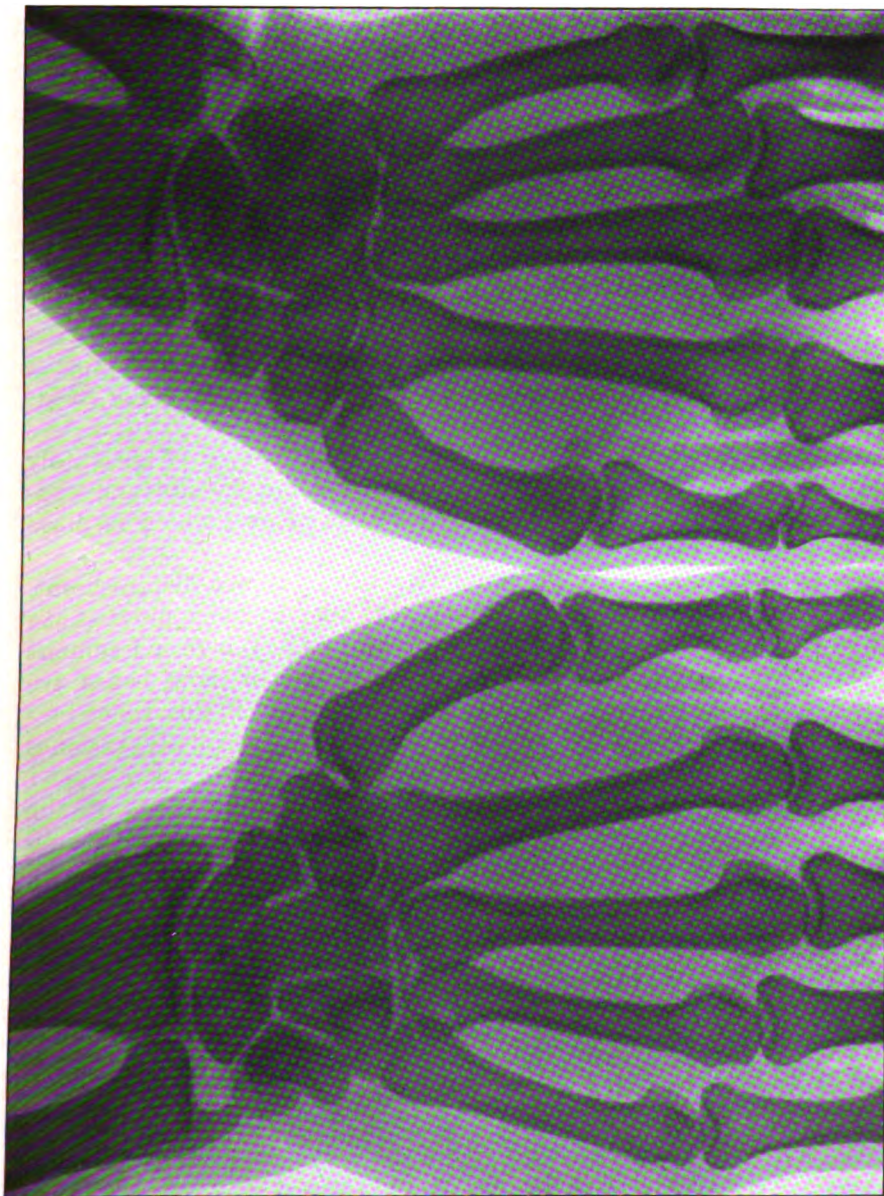
It cannot be too strongly insisted upon that it is absolutely necessary, for all comparative work, that some definite and constant points should invariably be made use of over which to place the antikathode.

Treatment, in cases of simple fracture, without displacement, may be summed up in two words, viz., massage and movement; these should be repeated daily from the first. Where a fragment is displaced it should be removed. When one or more bones are dislocated one effort may be made at reduction; if this be unsuccessful removal through a dorsal incision is the only rational treatment, and a very useful joint will result.

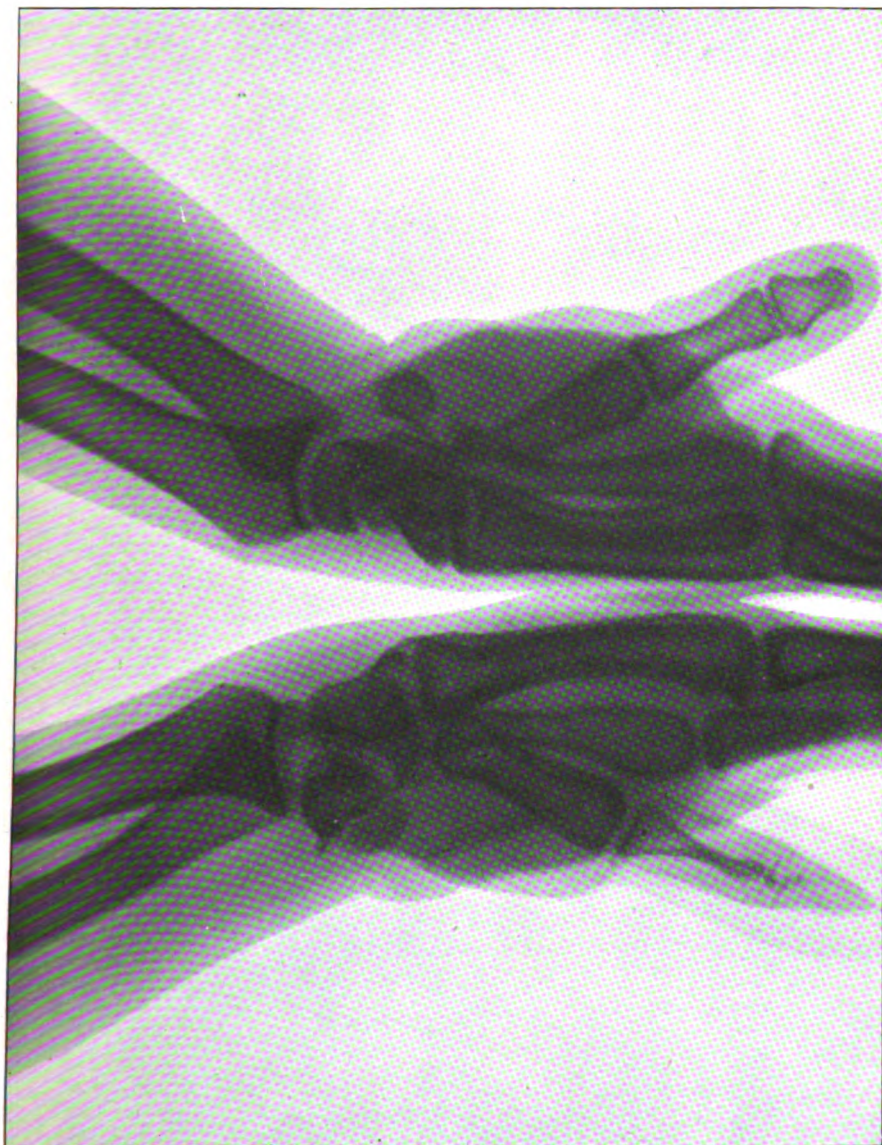
One of us, in one case, removed a detached fragment of the scaphoid, and in another case the three bones of the proximal carpal row; in each case a perfect functional result was obtained. (The pisiform is regarded merely as a sesamoid bone and so not included in the proximal row of carpal bones, but a case of fracture of this bone has recently been shown to us.)

CASE 1.—P. W. was leading a horse by head-rope, the horse suddenly drew back, and in the scrimmage the rope became twisted round the wrist and was then pulled tight. Swelling on radial side of wrist-joint, complete loss of movement on account of pain. Skiagram showed fracture of scaphoid. Through radial incision some fragments of bone and soft granulation tissue removed. Afterwards palpable callus thrown out. Discharged with perfect result. (M. P. H.)

CASE 2.—Corpl. D., whilst grooming horse, was kicked on knuckles. Extensive swelling over entire wrist, apparent dis-

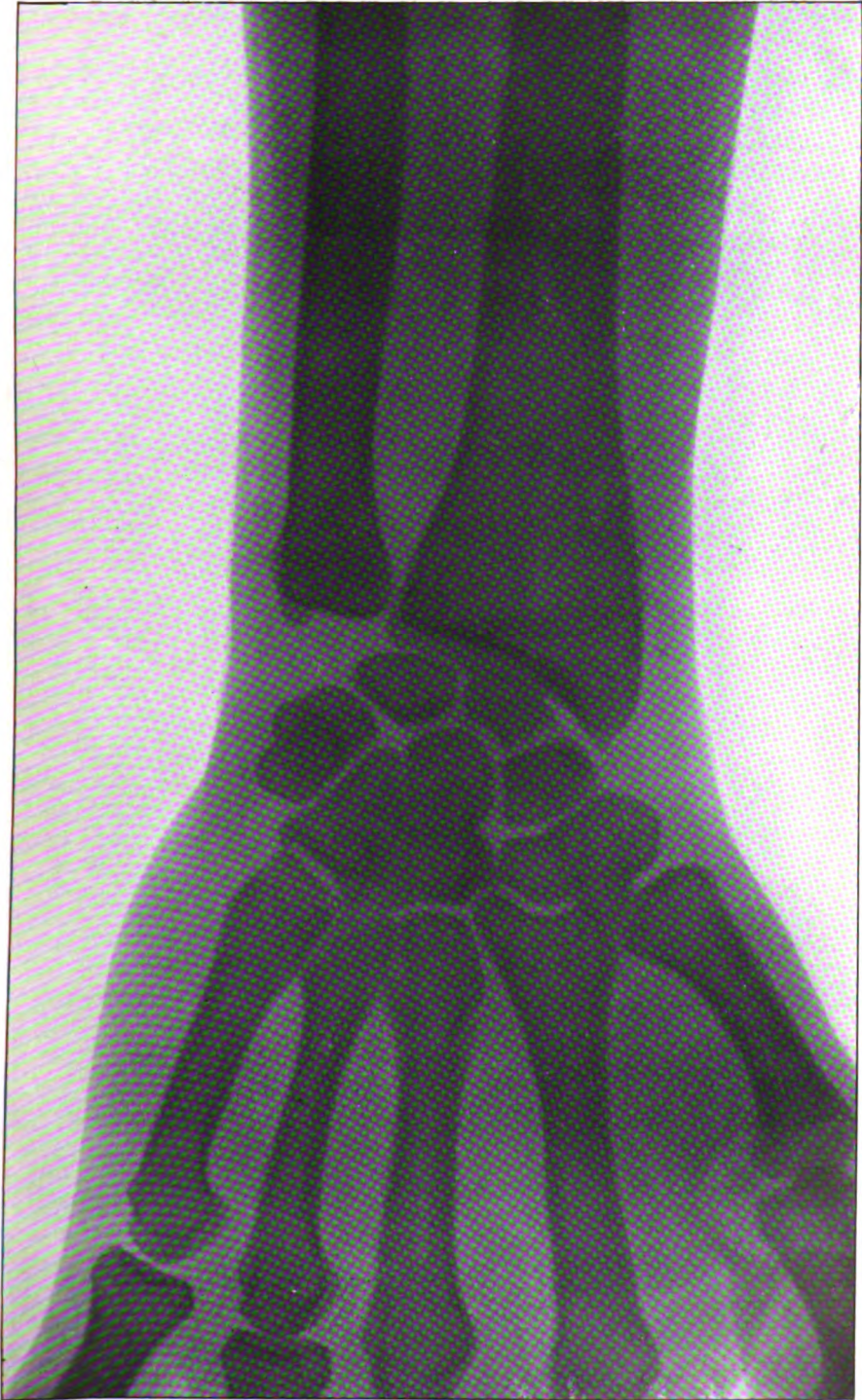


Case 2.



Case 8.





Case 5.



placement as of lower end of radius forwards, immobility of joint in position of extension and adduction. No flexion possible. Crepitus obtained under ether. Skiagrams showed comminution of scaphoid bone. Under ether, and with aid of fluorescent screen, manipulated fragments into position. There remained some limitation of abduction, due apparently to excessive callus thrown out; all other movements perfect. A more perfect result would probably have been obtained had the several fragments all been removed in the first instance. (M. P. H.)

CASE 3.—P. H. fell 5 ft. from a window. Swelling obliterating all outline, but an unusually hard lump felt below radial border of styloid process of radius; no other obvious deformity; complete immobility in position of extension; no flexion possible, even under anæsthetic. Unsuccessful attempt at reduction under ether, with aid of fluorescent screen. Later removed scaphoid in two fragments, the outer being found displaced outwards and the inner rotated on a longitudinal axis. Subsequently, having failed to obtain reduction of semilunar and cuneiform bones under anæsthetic, both these bones removed through dorsal incision. Result: perfect movements after prolonged exercises, with occasional passive movement under anæsthetic. Skiagram showed fracture of scaphoid and cuneiform, with dislocation forwards of semilunar and cuneiform bones. (M. P. H.)

CASE 4.—P. W., two years ago, whilst lifting some heavy ironstone, had a piece up level with chest, when it "took charge" of his right hand and fell back on to his chest. Was treated for several months for "sprained wrist." Result: complete permanent fixation of joint in extension. Skiagram shows old fracture of semilunar bone; much callus formation. Declined further treatment. (M. P. H.)

CASE 5.—Pte. M. was grooming horse when latter, by suddenly putting down foot, which he was holding in his hand, caused him to fall on to left hand with some force, about three weeks ago. Swelling very slight on outer side and front of wrist-joint proper. No other deformity. Impairment of abduction, and to less extent of flexion. Still painful and tender. No crepitus obtained. Thought to be sprain. Skiagram shows simple fracture across waist of scaphoid. No displacement of fragments. (M. P. H.)

CASE 6.—Mr. S. fell from "rings" in gymnasium on to floor on outstretched hand. Was not skiagraphed till some years afterwards, when wrist was quite useful. Fracture of scaphoid was

seen in usual position, *i.e.*, transverse at constriction. An additional facet was noted in articular surface of radius to meet the outer fragment of scaphoid. (W. S. H.)

CASE 7.—Mr. G. S. fell backwards playing tennis on gravel court. Had very considerable pain and loss of power for some days, till case was diagnosed and fracture reduced by manipulation, as far as possible. Result: useful joint. Case was not skiagraphed till some years after injury. Transverse fracture of scaphoid, in usual position. Prolongation of radial styloid process as in Case 6, in both of which fracture remained ununited. (W. S. H.)

CASE 8.—J. M., carpenter, fell forwards on outstretched hand. Great pain in wrist and base of thumb, and fixation of joint. Maximum tenderness over scaphoid and its fragment displaced out over styloid process of radius. Skiagraphed four weeks after injury. Scaphoid comminuted. Patient refused operation. Result: permanent stiffness and painful joint. (W. S. H.)

CASE 9.—Mr. R., whilst playing polo, fell, trailing stick, with wrist-joint in extreme adduction and extension. Great pain and fixation of joint. Pressure on median nerve causing referred pain and numbness. Skiagraphed within one week of injury. Stereoscopic skiagrams showed dislocation forwards and rotation about transverse axis of semilunar, also fracture of styloid, process of radius. Patient refused operation. Result not satisfactory when last seen. (W. S. H.)

CASE 10.—Pte. McK. fell from window about 20 ft. Compound dislocation and fracture of radius and ulna, also fracture of scaphoid bone. Amputation through forearm.

We have to acknowledge our indebtedness to Lieut. and Qmr. F. Bruce for some of the skiagrams taken for one of us (M. P. H.), the remainder were taken by ourselves.

NOTE.—Very fine skiagraphs of all the cases were received, but unfortunately we were not able to produce them all owing to want of space.—EDITOR.

NOTES UPON THE FURTHER INVESTIGATION OF THE PARASITES OF KALA-AZAR AND DELHI BOIL.

By MAJOR W. B. LEISHMAN.

Royal Army Medical Corps.

SINCE the parasitic bodies associated with Dum Dum fever and Kala-azar were first brought to notice, a large number of cases have been reported by various observers, and it is becoming more and more evident that the disease is by no means an uncommon one. It appears, further, that the disease is met with in countries widely separated one from the other, that it attacks children as well as adults and white men as well as the natives of those countries. So much we already know, but, as the knowledge of the parasites and of the methods necessary for their detection become better known, we are sure to hear of many more cases and will then be better able to draw useful deductions from the observed facts than is possible at the present moment.

So far, cases have been reported from three or four widely separated districts of India, Burma and Ceylon, from China, Tunis, Algiers, Egypt and Arabia; and now that attention is being drawn to the disease our knowledge of its geographical distribution should soon be rendered more precise, and this should enable us to discover whether there is any similarity in the physical and climatic conditions of the countries in which the disease occurs. Should some features be found common to all those localities they might possibly afford a clue to the nature of the intermediate host of the parasites, as the existence of such a host would appear to be necessary in most protozoal diseases, such as, for example, malaria and piroplasmiasis.

With regard to the symptomatology of the disease the chief features were noted in connection with the case published by Major H. B. Matthias and myself in a previous number of the *CORPS JOURNAL*, and the cases since published have not shown any other striking common feature, with the exception of the important fact that intestinal ulceration, usually affecting the colon, is apparently a very frequent concomitant of the affection. The dysentery and diarrhœa, referred to in the above article as common complications, were therefore probably due to this ulceration, which is in reality a part of the disease and not an adventitious complication. That the ulceration in question is specific is undoubted, since the parasites

have been found in large numbers in and around the ulcers. In this connection it appears to me probable that a certain proportion of the deaths attributed to chronic dysentery may, in reality, be due to this disease. Another symptom, to which attention was called in the above article, is the marked increase in the percentage of the large mononuclear leucocytes in the peripheral blood. Further experience has endorsed this point, the importance of which is obvious in view of the diagnostic value attached to an increase in the number of those leucocytes in cases of chronic malaria.

The transitory and localised œdemas of various regions of the body have not yet received the attention to which I think they are entitled, and it may be that an investigation of the lymphatics and glands may throw further light upon the distribution of the parasites in the body, and upon the channels by which this distribution is effected. It appears certain that the blood is an extremely rare carrier of the parasites, if indeed they are ever to be found in it, while there are several facts which would seem to point to the incrimination of the lymph.

Up to the present the parasites have been found in only a few situations in the body, chiefly in the spleen and liver, but also, occasionally, in the mesenteric glands, the kidney and the testicle, while, as mentioned above, they also occur in the ulcers of the colon. In all these situations they are seen in sections of the tissue to be intracellular and to lie in the protoplasm of large mononuclear cells, apparently of the nature of phagocytes or "macrophages." Free parasites are seldom if ever found in sections, but in films made from "smears" of organs, or obtained by puncture of these organs during life. Owing to the rupture of many of these cells the parasites are set free either singly or aggregated into clumps—the so-called "zoogloea masses." In such specimens the stroma or matrix, often seen surrounding the parasites, has the staining reactions of protoplasm and is indefinite in outline, thus indicating its probable origin as a portion of the protoplasm of the cell in which the parasites were originally embedded.

No mobility has ever been detected in fresh specimens of the unstained parasites, a fact which is probably partly responsible for their having been so long overlooked, but in stained specimens, especially when coloured to demonstrate the chromatin, their detection and identification presents no difficulty, since, at this stage of their life, their appearance is quite distinctive and remarkably uniform. Nothing approaching to the pleomorphism of, for instance, the malaria parasites is met with.

As regards the relationship between what I termed "Dum Dum fever" and Kala-azar, in both of which the parasites are met with in the same situations, it seems to be generally accepted that the two conditions are identical. Bentley and Rogers have found the parasites in almost every case of Kala-azar in which they searched for them, and in addition, the symptomatology of the two diseases is practically the same. It is, however, worth noting that high as is the case mortality of Kala-azar it falls short of that of the tropical fever occurring in Dum Dum, Madras and elsewhere. In the series of seventy-two cases reported by Donovan in which the parasites were found, it was stated that only in one case of those who survived was there any hope of ultimate recovery. However, this terrible mortality may after all only indicate that, once the disease has passed a certain stage, there is no hope of cure, and we are at present ignorant of the extent to which mild cases may occur followed by recovery.

The important questions as to the nature of the parasite and its proper biological place may now, I think, be said to have passed beyond the regions of hypothesis and controversy, and we need only await the completion and confirmation of Rogers' experiments to accept the fact that the parasites represent a stage in the life-history of a *Trypanosoma*. Rogers has succeeded in following the stages in the development of fully-formed *Trypanosomata* out of the parasites found in the spleen by cultivating the latter *in vitro*, and, from his description and the sketches of the intermediate forms shown at the Oxford meeting, there would appear to be little room for doubt or fallacy. Still, as Col. Bruce pointed out, the experiments must be repeated and checked by a series of rigorous controls before we can take Rogers' results as proven. Such confirmation we may hope will be forthcoming ere long.

Assuming their *Trypanosomal* nature to be established, a wide field for experiment and observation is thrown open to those who may have the opportunity to further our knowledge of the disease and its connection with the parasites. In the first place, now that we know what to look for—and a *Trypanosoma* is a difficult object to miss—the search for the alternative host should be one of the first objectives. Certainly, in this search, we have no lack of material for investigation, for we know that *Trypanosomata* occur in mammals, birds, reptiles and fish, while they have also been found in certain blood-sucking insects, although in this last instance it is still an open question whether the *Trypanosomata* are truly parasitic. In the investigation of this large area we may narrow

our field of search by remembering that the parasites are not met with in the peripheral blood, so it may not be necessary to add another crime to the long defaulter sheet of the mosquito. For the same reason other blood-sucking insects would appear to be improbable hosts. On the other hand we know that, since the ulcers in the colon harbour the parasites, it is practically certain that they may at times escape from the body in the fæces. True, their presence has not yet been detected in the fæces, but this may be owing to their assuming there some form intermediate between that of a *Trypanosoma* and that of a spleen parasite. The bodies described by Christophers as large bacteria occurring in his sections of the intestinal ulcers may, as I have elsewhere suggested, prove to be such an intermediate form, and would be unlikely to rouse suspicion if found in the stools. Be that as it may, the possibility of the parasites being voided in the fæces should help us in the search for the missing host, and many possible lines of investigation will suggest themselves in connection with sewage disposal and fæcal contamination. Of these, one at least strikes me as meriting exploitation for the following reasons. It will be noted that in Rogers' cultures he obtained the greatest multiplication of the parasites and the most perfect *Trypanosomal* forms the further he lowered the temperature of his cultures. This seems to me therefore to point to a cold-blooded host rather than to a mammal or a bird. As to insects, I am not aware if the body temperature of a mosquito or a glossina has ever been estimated, but I imagine that the stream of hot tropical air drawn in through the spiracles and distributed throughout the body by the tracheal tubes, must at least tend to keep their body temperature closer to that of a warm-blooded bird or mammal than to that of a fish or reptile. If this is so it would appear unlikely that the parasites would be able to develop into *Trypanosomal* form in insects.

On the other hand, we have cold-blooded animals, fish, some of whom we know to be liable to *Trypanosomiasis*, and such might conceivably become infected through fæcal contamination of the water in which they dwell by the dejecta from a case of the disease. Finally, after so much theory, we have the fact which has been put on record by Bentley, that in ponds adjoining a village where *Kala-azar* was rife he found 100 per cent. of a certain species of fish to be infected with *Trypanosomiasis*, while similar fish in other parts of Assam unaffected by *Kala-azar* showed no *Trypanosomata*.

To come to another point which it is very desirable should be settled, the question of the identity or non-identity of the spleen

parasites with those found in Delhi boils. It is quite possible these are, in reality, one and the same parasite, but I think there has perhaps been rather a tendency to accept this identity too hurriedly and without waiting for further proof than is afforded by the similarity of their appearance and by their staining reactions. If they are identical the great differences in symptomatology find a parallel in the behaviour of many pathogenic bacteria, which may at one time cause only a local inflammatory process, at another a grave and possibly fatal general infection. If this, however, were the case with the new parasites we would expect that, at least occasionally, the local condition would terminate in a general infection with the train of symptoms and the grave prognosis attaching to them; but no such sequence has been recorded, and although the Delhi boil may be accompanied by a certain amount of constitutional disturbance, it never appears to be followed by any such condition as we now know to be associated with the presence of the new parasites in the spleen and liver. Again, no hint of any association between Kala-azar and tropical sores has been put on record in the past and there appears to be no correlation between the geographical distribution of the two affections.

Col. Crombie, at the Oxford discussion, mentioned that he had observed in India an unusual incidence of Delhi boils in those who had to do with camels. This interesting observation reminded me of the fact that, in the Waziristan expedition of 1894, the 2nd Battalion of the Border Regiment, to which I was attached, suffered to a very large extent from sores of this nature, many of the men being temporarily incapacitated from this cause, and, although the coincidence did not at the time occur to us, the regimental transport consisted entirely of camels, with whom the men were naturally in daily contact. At all events, this is a point well worth following up, especially as camels are now known to be liable to a Trypanosomal disease.

Major Ross, however, some years ago found large numbers of another flagellate organism—a Cercomonad—in these sores, though he did not attribute to them any causative rôle, and it is possible that the bodies found by Wright may have a relation to Cercomonads similar to that which apparently exists between the spleen parasites and Trypanosomata.

Apart from the study of the life history of the parasite inside and outside the body, there is another point of the greatest practical importance, namely, the search for some means by which the presence of the parasites in the body may be detected, other than by

splenic or hepatic puncture. Attention has been rightly called by Sir Patrick Manson to the dangers of indiscriminate spleno-puncture, and an alternative mode of diagnosis is much to be desired. It is, I think, in the further study of the distribution of the parasites in the body and of the manner and form in which they are eliminated therefrom, that we may hope to find such a means of diagnosis.

In conclusion, it should be remembered that, even after the complete confirmation of Rogers' work, we shall still be in ignorance of the steps by which the *Trypanosoma*, however introduced, attains in the internal organs the resting form with which we are familiar, and also that we are not even entitled to assume as a fact that the parasite gains entrance into the body in *Trypanosomal* form—probably it does, but the possibility of its introduction in some as yet unrecognised form must be borne in mind.

Clinical Notes.

BLOOD-SUCKING FLIES FROM THE STATION SLAUGHTER- HOUSE, RANGOON—FORWARDED BY CAPTAIN H. S. ANDERSON, R.A.M.C.

By E. E. AUSTEN.
British Museum.

CAPT. ANDERSON is mistaken in supposing that the above flies belong to the genus *Glossina*, the species of which, commonly known as tsetse-flies, are confined to Africa. The insects found at the Rangoon slaughter-house are horse-flies of the genus *Tabanus* (Family *Tabanidæ*). The specimens are so much damaged as to make the determination of the species a matter of some difficulty, but they appear to belong to *Tabanus partitus*, Walk., which was originally described from Singapore. It may be remembered that three years ago Capt. Rogers, I.M.S., succeeded experimentally in transmitting *Trypanosoma evansi* to rabbits and dogs by means of the bites of horse-flies, and it is quite possible that *Tabanus partitus*, or other species of the same genus which closely resemble it, may play a part in the dissemination of the cattle sickness to which Capt. Anderson refers.

A SPIRILLUM IN AN ACUTE TROPICAL ULCER AT SIERRA LEONE.

By MAJOR F. SMITH, D.S.O.
Royal Army Medical Corps.

AND SIDNEY G. PEILL.
Princess Christian Cottage Hospital, Sierra Leone.

THE patient was a native boy, aged 7. He presented, on admission, a large, rapidly spreading, foul-smelling ulcer, situated on the calf of the leg, and said to have begun in the cicatrix of a burn. The ulcer measured some $9\frac{1}{2}$ by $3\frac{1}{2}$ inches.

Ordinary applications making no improvement, the boy was anæsthetised, the ulcer scraped, and the whole surface burnt with nitric acid. The scraping was found to be crammed with spirilla—faintly staining by Leishman, better by fuchsin. The spirilla bore the ordinary characteristics of such organisms, and moved about freely in a snake-like fashion of some four to six curves. There were other organisms, chiefly large bacteria, in the scraping. How much of the ulcer was due to one or other of the micro-organisms we do not know.

The scraping and nitric acid did not eradicate the spirillum, and after several subsequent applications of carbolic lotion it was still present in large numbers. A fortnight later antiseptic treatment had brought about a healthy condition admitting of successful skin-grafting. Spirilla were not found on the now normal granulating surface.

Cultivation from the original scraping resulted in a growth of bacteria only. The peripheral blood of the patient was examined several times and the boy was spleno-punctured, but with negative results in each case. Enlargement of the spleen had been noted on admission, but this organ diminished to the normal size while the patient was still in hospital. There were no spirilla in the mouth.

The temperature was raised while the ulcer was at its worst, but as the local disorder improved the body heat declined. Attempts were made to induce the disease in a monkey and in a guinea-pig, but neither the bacteria nor the spirilla produced any appreciable local or constitutional effect on these animals. Although we know so little about this spirillum, we think it well to make a note of it as a possible help to other observers.

A CASE OF ABSCESS OF THE LIVER, FOLLOWING GUNSHOT WOUND.

BY CAPT. H. W. K. READ.

Royal Army Medical Corps.

No. 22013 Trooper P. T., of Marshall's Horse, was wounded on March 24, 1902, during an engagement at Rhenoster Valley, about thirty miles from Sutherland, Cape Colony, whilst standing by the side of his horse. At the time he was hit he hardly felt any pain. The wound of entrance was in the right hypochondriac region, about $1\frac{1}{2}$ inches below the eighth costal cartilage. The direction of the wound was oblique from before backwards. The wound of entrance equalled in size that of the wound of exit. Some of his clothing, together with a brass button, were missing where the bullet entered. About ten minutes after he was hit he felt great pain in the part, and profuse hæmorrhage followed. He remained in Sunderland Hospital for about a month, and was then transferred to the Stationary Hospital, Magersfontein, Cape Colony.

On arrival, after a journey of six days (80 miles) by donkey convoy, his condition was grave. Temperature 104° F., with pain and enlargement over the liver region, the dulness extending 3 inches below the xiphoid cartilages, and upwards to the fourth interspace. The superficial veins over the part were very much dilated, and there was a feeling of deep-seated fluctuation on pressure. He was placed under chloroform on May 12, and an aspirating needle passed downwards and forwards through the eighth interspace in the mid-axillary line into a large cavity.

from which were removed sixty fluid ounces of dark-looking fluid consisting of pus and broken-down liver substance.

Owing to his debilitated condition it was agreed to leave the further operation for a few days. He was very much relieved by the aspiration, while the temperature fell to normal. The only matter of which he complained was hunger. His general condition having improved, and as there were signs of the abscess cavity again filling, together with irregular rises of temperature followed by sweating, it was decided to open freely and drain. On May 26 he was placed under chloroform by Civil Surg. J. A. Robertson. An incision $2\frac{1}{2}$ inches long was made in the eighth interspace between the axillary lines, reaching down to and opening up the abscess cavity. The finger was readily passed into a large space filled with dark-coloured fluid mixed with shreddy, broken-down material. The cavity was carefully washed out with warm boracic lotion and a piece of large drainage tube about 4 inches long was inserted. The tube was removed and shortened each day, while the cavity was frequently irrigated with warm boracic lotion. The temperature remained irregular for three days following the operation, being 98.6° F. in the morning, rising to 101° F. at night. The discharge rapidly decreased, the patient's health improved, he increased in weight, and finally made an uninterrupted recovery. The only symptom he complained of, as after the former operation, was hunger.

The case is interesting mainly for the reason that the abscess resulted from a bullet wound and the introduction of a foreign body into a presumably healthy organ.

The only symptom complained of after the operation was very great hunger. Physiologists may be interested in this symptom, especially as the right lobe of the liver was the part affected.

A POCKET CASE-BOOK.

By CAPT. L. W. HARRISON.

Royal Army Medical Corps.

Most officers, in writing up their cases, must have felt the inconvenience of having to walk about from one place in the hospital to the other to consult the necessary sources of information (temperature chart, diet sheet and prescription book).

Sometimes it is impossible to write up a case at once owing to stress of work, and one is apt to forget points of interest.

A pocket case-book, of which a page (reduced) is represented below, made for me by Reynolds and Branson, Limited, Leeds (from whom they can be obtained, price 6d.), was designed to obviate this difficulty.

I have found it invaluable for reference in writing up cases, and it has

The book fits into the breast pocket, provides for records covering twenty-one days on each leaf, and there are thirty leaves. The back of each leaf is blank for additional notes.

NAME _____ AGE _____
RANK _____ CORPS _____ SERVICE _____
HISTORY & CONDITION ON ADMISSION -

EMERGENCY CASE CHART.

Published by McGraw-Hill & Company, N.Y.

BY MAJOR N. FAICHNIE.
Royal Army Medical Corps.

A PRIVATE in the 2nd Border Regiment, stationed at Thayetmeyo, Burmah, came to me at the Station Hospital in February, 1903, suffering from dislocation of the internal semi-lunar cartilage of the right knee-joint. The disability was of about two years' duration, and had originally occurred before enlistment, since when, and especially during the six months before reporting sick, the displacement had frequently recurred, so that the man was practically unfit for service. The dislocation would occur during gymnasium work, at signalling, or on bending the knee to shoot. By bending the leg and quickly straightening it again the cartilage could easily be replaced by the man himself. The curious fact about the

case was that the displacement led to no synovitis of the joint, and that the man could dislocate and replace the cartilage at will.

About a fortnight before admission the cartilage was dislocated and could only be replaced by me under an anæsthetic. After this the man asked for an operation to get the joint permanently cured. Before giving the anæsthetic for the operation the patient displaced the cartilage so that it could be felt distinctly under the skin. This was cut down on, the joint was opened, and as much of the ligament as could be caught with forceps was cut away with a pair of scissors.

The wound healed by first intention, and on the tenth day the stitches were removed. On the fourteenth day the patient was able to walk, and a week later he was discharged from the hospital. About a fortnight after discharge he was able to do fourteen days' imprisonment with hard labour without inconvenience.

NOTE.—The case was a very favourable one to operate on, as there was never any synovitis, although the dislocation was of frequent occurrence. At the same time, considering that in cases of recurrent dislocation of the semi-lunar cartilages the synovial membrane frequently becomes thickened and the joint permanently diseased, I consider that the result here obtained indicates that early operation for removal of the cartilage is the soundest treatment.



Echoes from the Past.

THE ARMY SURGEON, AND THE CARE OF THE SICK AND WOUNDED DURING THE GREAT CIVIL WAR.

BY CAPT. H. A. L. HOWELL.
Royal Army Medical Corps.

PART I.

THE Civil War brought about several important changes in the medical organisation of our army. During the Elizabethan and early Stuart periods the unit of medical organisations in the field was the Company—each company having its own surgeon and medical equipment. The Civil War witnessed the disappearance of company surgeons and the introduction of the regimental system. Each regiment was now to have its surgeon, assisted by one or two junior surgeons known as “Surgeon’s Mates.” The new system, based on the unit of the regiment, existed in our army for over two centuries, but was soon supplemented by an extra-regimental medical staff, which had charge of the staff of the Army and of the large general hospitals.

There were many reasons for the disappearance of the company system. The provision of a surgeon to each company necessitated a very large number of surgeons. It had always been found difficult to obtain sufficient medical officers for the army, and in order to keep up their numbers, surgeons had, at times, to be obtained by impressment. The provision of company surgeons had been almost entirely in the hands of the captains of companies, and they, only too often, neglected their duty in this respect, and either supplied no surgeons at all, or enrolled as surgeons men who were not in any way qualified to hold that position.

The Royalist troops were chiefly volunteers who served largely without pay. We are not therefore surprised to find that, although the Royalist Army Medical Staff included many able men, it was not strong in numbers. Parliament had control of the resources of the State, and was thus able to pay its soldiers and surgeons well. Both sides, however, had great difficulty in maintaining a sufficient medical staff, and their armies were, in fact, largely dependent for medical aid on the local practitioners of the districts in which they happened to be. It is probable therefore that, owing to financial

considerations and the want of supply of efficient surgeons, the abolition of the company system became necessary in both armies. We must not forget, however, that on the Continent Gustavus Adolphus had, for reasons similar to those given above, already introduced in his army a regimental system of medical aid. In his Scots Brigade¹ each battalion, consisting of 1,008 men, had four surgeons attached to it, and, later, we find the number of surgeons in the brigade reduced, four surgeons being in charge of 8,316 men. (These surgeons received pay at the rate of 32 Rix dollars a month, which sum, according to Mackay, would be equivalent to £28 in modern English money.) Before the outbreak of the Civil War in England the Continent was the field to which numerous English, Scots, Irish, and Welsh proceeded to receive training in the art of war. Scots and Welsh flocked to Gustavus; English sought service under William of Nassau; and the Irish adventurers usually found their way into the French armies. When the Civil War broke out, numbers of these veteran soldiers returned to their native country and joined one side or the other. There is no doubt but that the organisation of the English and Scotch regiments in the field was largely based upon Continental models. It is therefore probable that the medical arrangements also came under the same influence.

Although, as a matter of fact, there were, during the Civil War, never sufficient surgeons in either army to provide a full complement of company surgeons, the company surgeon was not definitely abolished until 1655.

Before the outbreak of the Civil War the ranks of Physician-General and Surgeon-General were practically unknown. There had been a Physician-General to the Army in Ireland, and Woodall had been Surgeon-General to the East India Company, but these were apparently the only two appointments to these ranks prior to the Civil War. The continuation of the war soon brought to notice the necessity of some professional superintendence of the medical arrangements of armies in the field, and we now find, in the Parliamentary armies at least, that this was recognised. To each of the Parliamentary armies was appointed a Physician-General, a Surgeon-General, and an Apothecary-General. It would appear, from a reference in Wiseman, that Leslie's Scottish army

¹ This Scots Brigade afterwards entered the French service, where it was joined by some officers of the Scottish Guard and became the Regiment d'Hebron. Later it became part of the British Army, and is now represented by the Royal Scots.

also had a Surgeon-General; but this was, I believe, the only appointment to that rank on the Royalist side. In the Royalist armies the physicians and surgeons on the staff of the General presumably directed the medical arrangements. When Royalty was in command the duties of superintending surgeon were apparently performed by the Sergeant-Surgeon, but there is no direct evidence that such was the case.

The Civil War was also associated with the first appearance in our army of hospitals definitely set aside for wounded and sick soldiers, and with the institution of an organisation for the relief of the sick and wounded, for those who were permanently disabled, and for the soldiers' widows and orphans.

In the early part of the war the Royalist army was better equipped and better manned than its opponent, and its medical arrangements were probably more complete. Parliament, however, held London, and the Company of Surgeons, which had for some years directed the medical arrangements of the army and controlled the supply of army surgeons, was also on the Parliamentary side. The Universities of Oxford and Cambridge were at first able to supply Charles's army with many able physicians and surgeons, in addition to those whose loyalty had already led them to join the forces of their King; but as the war went on, London, Cambridge and Oxford came under the control of Parliament. These sources of supply of medical officers were thus practically cut off from the Royalists, and the longer the war continued the better the Parliament was able to supply surgeons and physicians to its forces. As time went on, the medical arrangements in the Parliamentary armies steadily improved, whilst the opposite was the case on the Royalist side. The Royalist medical staff, however, certainly always included many men eminent in their profession, such as Harvey and Wiseman, and, in times of truce, they were consulted by many Parliamentarians.

When the Parliamentary army was in need of more surgeons the Corporation of Surgeons was usually called upon to provide them. An extract from the Journals of the House of Commons, dated October 12, 1644, shows that the Corporations of Surgeons and Apothecaries were empowered to obtain surgeons by impressment if necessary. It runs: "Ordered that it be referred to the Masters and Wardens of the Apothecaries and Surgeons, to make choice of able and fit men for surgeons to be sent to my Lord General's army; and if such as be chosen and be appointed by them shall refuse to go, that they repair to the Committee of the

Militia; and that they give orders to the pressing of them for the said service." The impressment of surgeons as well as of soldiers for military service was no novelty. On the outbreak of the Irish Rebellion in 1641 it had been enacted that the justices, &c., should "raise as many men by impress for soldiers, gunners, and chirurgeons as might be approved by His Majesty and both Houses of Parliament." Many of the soldiers and surgeons so levied for service in Ireland were ultimately embodied in the Parliamentary forces employed in England.

The war began by the King raising his standard at Nottingham on August 22, 1642. At first the Royalists were most successful, especially in the West of England. A great battle was fought at Edgehill, on October 23, 1642. The battle is of little interest to the medical reader, but one may note that Harvey, the discoverer of the circulation of the blood, was present at the battle in his capacity of Physician to the King. We read that, during the battle, "a little aside, under a hedge, might be seen an elderly man reading a book. This was Harvey, and beside him were two boys of whom he had charge. The elder was afterwards Charles II., the younger James II." After the battle Harvey accompanied the King to Oxford. He quitted the King's service in 1646. At Edgehill, also, the King's Standard-bearer, Dr. Edward Verney, was slain. After Edgehill the Royalists fell back upon Banbury and Oxford, and the Parliamentarians retired to Warwick. The Parliamentary wounded who could not be carried away were, to the number of two hundred, left at Keinton. On the Tuesday after the battle Rupert and his troopers raided the town, and the wounded "were all most inhumanly slain by him." (So writes Nehemiah Wallington, but Ludlow, who also refers to the incident, does not state that *all* were slain.) This was an unusual incident, for in most cases the wounded were treated fairly well on both sides, and were not always detained as prisoners of war if they fell into the enemy's hands. When Prince Rupert took Bristol, in 1643, the Articles of Capitulation provided that the garrison should be allowed to march out to Warminster, together with the sick and wounded, and those unable to be moved on account of sickness or wounds were to have liberty to depart when they recovered. Similar articles were drawn up when Skippon's Parliamentary army in the west surrendered to Prince Maurice, in 1644. It was provided that "all sick and wounded shall lie at Foy (Fowey) till they be cured." The Parliamentary sick and wounded were, however, afterwards ill-treated and robbed of their clothing

by the Cornish women. As a general rule, the surgeons were well treated by both sides, and were rarely detained as prisoners if they fell into the hands of the enemy. They were, on occasion, permitted to enter hostile camps or fortresses to attend to any of their own party who might be prisoners and required medical aid. In 1644, one Henry Johnson, Surgeon of the King's own troop, wrote to the Parliamentary Governor of Newton Pagnell, requesting the release of his apprentice, who had been taken prisoner in a skirmish at Kidlington. In March of the same year, when Lord Fairfax was defeated before Pontefract, his wounded were taken into the Castle, and we find Col. Lowther, the Royalist Governor, writing to Lord Fairfax that there was a want of medicaments for the number of Parliamentary wounded, and that one of the Parliamentary surgeons, "a chirurgeon of your party," was doing what he could for them. Fairfax wished to send his own surgeon into Pontefract, but the Governor refused, saying, "I shall join my own surgeons with one of your party, a prisoner here, to use the best of their art in the cure of the poor wounded soldiers."

Then, as now, the surgeon ran the same risks of wounds as his combatant comrades. An instance may be quoted. When Ludlow was besieged with a company of foot and a troop of horse in Warder Castle, in Worcestershire, in 1642-43, he wrote: "Our medicines were now spent, and our surgeon, who with eight of his brothers served at that time in my troop, shot through the body and disabled, though the bullet glancing, missed the vitals." During this siege truces were made at different times to enable the wounded to be removed. When the besieged yielded, their sick and wounded were left for a time in the Castle, and, after "a popish priest, very solemnly, with his hands spread over them, had cursed them three times, were carried from thence to Bristol."

During the siege of Nottingham, where Col. Hutchinson was the Parliamentary Governor, we find that he had no surgeon in the Castle, but the wounded of both sides, "for want of another surgeon, were brought to the Governor's wife, and she having some excellent balsoms and plaisters in her closett, with the assistance of a gentleman that had some skill, drest all their wounds, whereof some were dangerous, being all shotts, with such successe, that they were all well cured in convenient time." (This lady was the daughter of Sir Allen Apsley, Lieut.-Governor of the Tower during the time Sir Walter Raleigh and Mr. Ruthen were prisoners there. Lady Apsley is said to have had some skill in medicine, and to have assisted Raleigh in his chemical experiments.)

It may be of interest to note that, during the many sieges of the Civil War, the usual provisions laid in for a siege were butter, cheese, bacon, dried fish, "bread corne," beeves, and beer.

Siege operations were usually attended by a great deal of sickness amongst the troops. When possible, troops were billeted upon the inhabitants, for only the superior officers were provided with tents. Frequently, as at Newark, the besiegers were obliged to sleep in the open, either in the fields or on straw in the trenches. When the Earl of Essex besieged and took Reading, in 1643, the mortality from sickness among his troops, which was attributed to the "infected air of the town," was so great that he was obliged to fall back towards London, and quartered his sickly troops at Kingston and other neighbouring towns. Essex also sent large numbers of those who were seriously ill to London for treatment. In fact, London now became the base to which all the chronic cases of sickness and of severe wounds were sent by the Parliamentary forces. Parliament arranged with the hospitals of St. Thomas, St. Bartholomew, Bridewell, and Bethlehem, for the reception of all sick and wounded soldiers sent to them, and agreed to pay for their "cure and diet" whilst in hospital. The expense incurred on this account, however, became so great that, in 1644, Parliament compounded with these hospitals for this expenditure by exempting them from all taxation. At St. Bartholomew's, in 1644, 1,122 "maimed soldiers and other diseased persons" received treatment; and at St. Thomas's, in the same year, 1,063 persons were admitted to the hospital, "whereof a great number have been soldiers." Ultimately the numbers of sick and wounded became so great that these hospitals were unable to cope with them, and Parliament was therefore obliged, in November, 1644, to establish a large military hospital at the Savoy. This hospital was under the direction of Commissioners appointed by Parliament. We may note that throughout the greater part of the war the establishment of military hospitals, and the control of the expenditure incurred in arranging for the care of the sick and wounded in the Parliamentary armies was entrusted to Commissioners appointed by Parliament; and these Commissioners, who were attached to each of the Parliamentary armies, reported directly to the Speaker of the House of Commons. The superintendence of medical concerns by the Physician-Generals and Surgeon-Generals of the different armies was confined to purely medical affairs. They appear to have reported to their Generals, who, in turn, reported to headquarters in London.

At this time, Dr. St. John was "physician to the train and person," and Lawrence Lowe "surgeon to the train and person," in Essex's army. Each of the regiments on the Parliament side had a surgeon and his mates, and these mates were frequently apprentices of the surgeon, that is, they were not fully qualified men. On July 1, 1643, the House of Commons "ordered that Dr. Paul de Laune and Dr. Nathalean Chamberlaine, Physicians, be forthwith sent to the army for the service of the Army; and the House doth declare that whatever physicians or surgeons shall be employed by the House, shall have the same allowances as others formerly have had. And the two surgeons now to be employed shall have their chests furnished with medicines, each of them to the value of twenty pounds." The Masters and Wardens of the Apothecaries were also directed to view the chests "that they bee good." These chests, which contained the medical and surgical equipment carried by each surgeon and physician, varied in cost during the war. Before the war, in 1626, the surgeon's chest cost £17, and, if he required additional drugs or surgical dressings, he indented upon the Surgeon-Major who had a reserve chest, "of £48 valew." Surgeons-Major had now disappeared; and if the surgeon or physician required additional medicines, he obtained them by indent on the Apothecary-General—an official who first appeared in our army during the Civil War, whilst surgical necessities and external remedies were indented for on the Surgeon-General. In 1643 the surgeon's chest cost £20. When Cromwell's army was being equipped for the Scotch campaign of 1650, each surgeon's chest cost £15, and the surgeon was allowed £10 for a horse to carry it, and two shillings a day for the up-keep of the horse. In 1652 thirteen surgeons' chests cost, on one occasion, £181 0s. 1d.; on another, £196 19s.; but a fortnight later £183 6s. were paid for twelve surgeons' chests. These were for the army in Ireland. The surgeon's chest was carried on a horse's back. In Ireland there was, at times, a scarcity of medicines owing to the difficulty of replenishing the chests. General Ludlow describes, in his memoirs, the great loss he suffered when fighting in Clare, the pack-horse, with the medicines, having fallen into the river and been carried away by the current.

We read in the "*Mercurius Anglicus*" that, after the first battle of Newbury, in which the Royalists were victorious, the Rebels "were forced to leave behind them heavy carriages, with many barrels of Whiskey and Pistoll Bullets and very many chirurgeon's chests full of medicaments." On this occasion King Charles I. sent the following order to the Mayor of Newbury:—

"Our will and command is that you forthwith send into the townes and villages adjacent, and bring hence all the sicke and hurt souldiers of the Earl of Essex's army, and though they be Rebels and deserve the punishment of Treators, yet out of our tender compassion upon them, as being Our subjects, Our will and pleasure is that you carefully provide for their recovery, as well as for those of our Own Armay, and then to send them to Oxford. Given, &c."
"To the Major of Newbury and the officers thereof."

When Charles fell back after the second battle of Newbury, the Royalist wounded were left behind at Donnington Castle, and ultimately fell into the hands of the Parliamentary army.

After the battle of Naseby, in 1645, the prisoners, many of whom were wounded, were collected together and placed under guard in Harborough Church. The number of Parliamentary wounded was so large after this battle that it became necessary to collect them together in the town of Northampton, and owing to the want of sufficient surgeons to attend to them, Parliament sent a number of surgeons from London. Skippon had been severely wounded in the battle, having received a shot in the side. He was one of the most able of the Parliamentary leaders, and the House, in its anxiety, sent a skilled surgeon from London to attend him.

In the same year Prince Rupert was besieged in Bristol. There was a great deal of illness in the town, for plague had broken out there. Fairfax's army took the town by storm on September 11. The sickness spread to the Parliamentary troops, and was so bad that Fairfax (as he tells us in one of his letters) was obliged to march his army out of the town and go to Caversham and Penfold. Firth quotes a characteristic letter from the Parliamentary Commissioners, Pinder and Leighton, to Speaker Lenthall, which describes the arrangements for the care of the sick and wounded after the capture of this city. They wrote: "We shall now make bold to present you with an accompt of the being and wel-being of such wounded men as were left here, after the taking of the citty and Barclay Castle, for whom, according to the Generall's order and our best judgment, we appointed an hospitall, and placed therein so many as the house could conteine, with nurses and chirurgeons fitting for them, and as our number increased we added house-rooms and attendants to them: which though a house of great receipt yet not sufficient to hold all our foot soldyers, we caused the horse to be quartered in the country, which hath been one addition to their burthen, though not in giving free quarter—which we have paid

in money for the most part—yet in disquiet of theyr houses, destruction of theyr beddinge, linnen, and consumption of theyr fiering, which bath been the more enforced, the generality of theyr wounds being fractures of bones and dismemberinges by plugg-shott from the enemy, expressing height of malice, rather than martiall prowess. Sir, we bless God the greater number are returned to the Army, well recovered.”

Wallington notes that in 1645 fifty-three men who had been prisoners in Oxford, and who had been “cut, hacked, and wounded,” were sent by Sir Thomas Fairfax to London in carts and there taken to hospital.

In November of this year there was a great outbreak of sickness amongst the Parliamentary troops whilst at Autree, engaged in the siege of Exeter.

In 1645 Parliament reorganised its army. “The pay of the private soldier was much above the wages earned by the great body of the people.” Parliament, by its “self-denying ordinance,” got rid of its weaker generals, and, under Cromwell’s guidance, the army was entrusted to the care of those generals who had proved their worth and skill during the war. The ranks, which even in Hampden’s regiment had contained large numbers of “hirelings whom want and idleness had reduced to enlist,” “a mere rabble of tapsters and serving-men out of place,” were now filled with a better class of men and subjected to a sterner code of discipline. At the same time, in order to bring the army up to a proper strength, numbers of soldiers had to be raised by impressment. On the whole, however, the standard of the soldier was raised socially and morally by the remodelling, and the change bore good fruit, not only in an increased fighting efficiency in the field of battle, but in an improvement in the health of the army. During the war, at Bristol, Newark, Leeds, Chester, Manchester, Liverpool, and other towns, outbreaks of plague were associated with the movement of troops or with siege operations. War typhus was fearfully common during the first two years of the war, but, strange to say, as Creighton points out, after Fairfax and Cromwell took command of the Parliamentary Army the health of the troops greatly improved, and during the later years of the war, typhus—the invariable companion of troops during the wars of the seventeenth and eighteenth centuries—became almost unknown. It is probable that when the army was remodelled new camp regulations were introduced and rigidly enforced, and greater care paid to the health of the troops, although we have no positive records of this. It is

certain, however, that the discipline of the army was greatly improved by the remodelling, and regulations of all kinds were more thoroughly carried out.

When the New Model Army was established, two physicians and an apothecary were appointed to the headquarter staff of the army. "The "physicians to the Army" were Drs. Payne and Strawhill; the apothecary was Master Welb.

Each of the armies in Ireland and Scotland had its own Physician-General, Surgeon-General, and Apothecary-General, an arrangement which was to last for many years after the restoration.

Of these, the Physician-General ranked highest. At this time very few of the physicians to the army are mentioned in the Roll of the College of Physicians, but the Physician-General to an army was usually a man of some eminence in his profession. Dr. Henry Glisson was Physician-General to Manchester's army. Dr. Samuel Barrow was Physician-General to Monk's Scottish army. Barrow was a man of some political importance in his day and took a leading part in the intrigues which led to the restoration of Charles II. He enjoyed Monk's confidence to a large extent, and was not only Physician-General to his army, but also Judge-Advocate. Cromwell's army in Ireland had as Physician-General, Dr. John Waterhouse. Cromwell evidently had a high opinion of Waterhouse, for soon after Cromwell had become Chancellor of Oxford University, he wrote the following letter to Dr. Greenwood, the Vice-Chancellor :—

"Edinburgh, February 14th, 1650.

"Sir,—This gentleman, Mr. Waterhouse, went over into Ireland as Physician to the Army there; of whose diligence, fidelity, and abilities I had much experience. Whilst I was there he constantly attended the army; and having to my own knowledge, done very much good to the officers and soldiers, by his skill and industry; and being upon urgent occasion lately come into England, he hath desired me to recommend him for the obtaining of the Degree of Doctor in that science. Wherefore I earnestly desire you that, when he shall appear to you, you will give him your best assistance for the obtaining of the said Degree; he being shortly to return back to his charge in Ireland. By doing whereof, as you will encourage one who is willing and ready to serve the public, so you will also lay a very great obligation upon, Sir,

"Your Affectionate Servant,

"OLIVER CROMWELL."

Waterhouse was therefore "Created Doctor of Physic by virtue of the letters of Oliver Cromwell, General," on March 12, 1651. Carlyle says Waterhouse had been "a student heretofore for eighteen years in Trinity College, Cambridge," and that he was a native of Great Greenford, in Middlesex.

Cromwell also had a "Chirurgion to his excellency's person and train," one James Winter, and there was a "Chirurgion-General to the officers of horse," Thomas Trapham. These received pay at the rate of 4s. a day, and each had two "mates," who received 2s. 6d. a day. Samuel Moule appears to have been the surgeon to Cromwell's Ironsides.

(To be continued.)



REPORT OF THE ROYAL COMMISSION ON THE WAR IN SOUTH AFRICA.

As the actual volumes of this important report are unlikely to be accessible to the majority of members of our Corps, while the evidence contained in their pages cannot fail to be of interest to our readers, we propose giving a *précis* of the evidence so far as it relates to medical organisation before and during the late campaign. For this summary, which is continued from p. 206, vol. iii.; we are indebted to Lieut.-Col. Edwin Fairland. It deals mainly with evidence regarding medical equipment.

Lieut.-Col. E. M. Wilson, C.B., C.M.G., D.S.O., D.A.D.G., A.M.D., being examined, said :—

(Q. 11,265.) I do not think you were in South Africa? No.

(Q. 11,266.) What is the position you hold now? I am in charge of the subordinate male *personnel* of the R.A.M.C., up to the rank of Quartermaster and Sergt.-Major, N.C.O's. and men. . . . The establishment is designed for the number of N.C.O's. and men required for hospitals on a peace basis. We have never estimated in view of war.

(Q. 11,271.) And no account has been taken in that estimate of the possibility of expansion? No; of course we have the Reserves. . . . When the war broke out, our total numbers, plus the Reserves, were 4,000. The authorised establishment was 3,045. . . . For an Army Corps you want six bearer companies and ten field hospitals. The number required really depends upon the climate you are working in. For South Africa they allowed 10 per cent. of sick.

(Q. 11,284.) That is not my point; I want to know what number of R.A.M.C. would be required for an Army of 100,000 men? That, I say, would depend on the number of sick you expect. . . . In a European war they would still require 10 per cent.

(Q. 11,288.) No, my question is this: assume that you are going to employ anywhere you like a force of 100,000 men, how would you calculate the number of R.A.M.C. required for it, or have you never contemplated it in that way, or looked at it from that point of view? If you anticipate you will have 10,000 sick, that requires so many general and so many field hospitals.

(Q. 11,289.) But how many? That depends, as I said before, upon the number of sick and wounded anticipated, whether it is 8 or 10 per cent.

(Q. 11,290.) Supposing it is 10 per cent.? You require so many general hospitals, 520 beds each; so many stationary hospitals at 100 beds each; therefore you have your 10,000 sick prepared for, and each of these hospitals has a fixed R.A.M.C. *personnel*.

(Q. 11,291.) Supposing you were sending 100,000 to Kamtchatka, and we wanted you to furnish us with the proper number of R.A.M.C. men for that force, what number would you send? I should say, roughly speaking, between 4 and 5 per cent. practically of the fighting force, but it really depends, as I said before, upon the climate. The West Coast of Africa would be much more unhealthy than Europe; and if you were anticipating a big battle, you would get a very large number of wounded. I think, roughly speaking, you might say between 4 and 5 per cent. of the fighting force.

(Q. 11,293.) Have you any idea whether you ever had in South Africa 4 or 5 per cent. of the fighting force there employed of the R.A.M.C., exclusive of doctors? No, not at any one time.

(Q. 11,294.) Do you know what percentage you did have? We had just about 4,000 men; we were also largely increased by the local Corps, Imperial Bearer Corps and Imperial Hospital Corps, the Natal Volunteer Ambulance Corps, and the Cape Medical Staff Corps. They were raised on the spot, and helped us enormously. . . . At the end of March, 1900, the total force engaged was about 207,000; there were 800 medical officers, 6,000 hospital subordinates, and 800 nurses, 8,900 in all. That would be about 4 per cent.

(Q. 11,299.) Take those 6,000 subordinates; you say you had only 4,000; how did you make up the balance of 2,000? From the local corps I mentioned. We had at least 1,400 of the Natal Volunteer Ambulance Corps, but they soon became disembodied; and very often some of the same men joined the Imperial Hospital Corps and the Imperial Bearer Corps, there were about 600 of each. The Cape Medical Staff Corps was also very largely increased. We made the wastage good, which settled down to a demand of 100 a month, by help from the St. John's Ambulance Brigade; altogether from it we had 2,300 men. Afterwards we enlisted men under a special Army Order as medical subordinates.

(Q. 11,305.) Had it occurred to you in time of peace, before the war broke out, that you would have to draw upon those sources? No, not before the war broke out.

(Q. 11,306.) Then what was the idea before the war broke out as to how you would deal with a state of war? Did you imagine that the R.A.M.C., such as it was, only organised for peace purposes, would be sufficient for war purposes? No, no Director-General thought that.

(Q. 11,307.) Then what was the Director-General's idea as to how he would meet a state of war? It was said that we should employ very largely more female nurses, and get civilians.

(Q. 11,308.) Where is that stated; in any official document, or in

regulations, or in any document which you could produce, or which could be produced? I do not think I could produce any document, but if you will allow me to refer to the Royal Commission on South African Hospitals, you will find something much to that effect stated by Director-General Jameson.

(Q. 11,309.) But had you any idea in your own mind, before war broke out, as to how you would deal with a state of war? We could do nothing but call up the Reserves.

(Q. 11,310.) And in the Reserves you had 1,000 men? Yes.

(Q. 11,311.) And that was your limit? I can tell you what we did if you would like to hear it.

(Q. 11,312.) If you please? The first thing we did was to embody the Militia Medical Corps. The next thing was to issue a special Army Order in 1900, allowing us to use or enlist the Volunteer Army Medical Corps. Then we issued another Army Order to bring back all old soldiers of the R.A.M.C. for hospital duties at home, and we obtained authority to employ the St. John's Ambulance Brigade. Then we also made a civil contract to employ civilians in hospitals at home, which we are doing still.

(Q. 11,314.) Most of these points were considered, I suppose, after the war broke out? Yes.

(Q. 11,315.) So far as you know, none of them had been considered before the war broke out? Before the war broke out there had been a commencement made with the St. John's Ambulance Brigade, and it was on the basis of those figures, which were got out comparatively early in 1899, that we were so successful when the war did begin. It was begun as a regular idea of the Reserve before I came into office; but it rather hung fire until the urgency became manifest. When once the urgency became manifest we got the greatest assistance, and there was very little difficulty in getting things done. The foundation of using the St. John's Ambulance Brigade as a reserve had been laid before the war broke out.

(Q. 11,316.) Supposing that the force in South Africa had been limited to two Army Corps, and that the war had been fought with two Army Corps, do you consider that your establishment would have been sufficient to have coped with the war? It would not have been sufficient, but the difficulties would have been very much less, of course.

(Q. 11,317.) Obviously; but even under those circumstances you think you would have had to draw upon most of these sources of supply—you would have had to look to civilian aid? Yes, we cannot take any men from our hospitals at home without replacing them; and to make up the force for any foreign campaign you must take away men from the hospitals at home.

(Q. 11,318.) But the Army organisation as a whole is considered with a view to war, is it not? Yes.

(Q. 11,319.) Only it is the fact that your particular department is really organised for peace purposes and with no view to war? Is that what I am to understand? That is the case. Everybody knows that when the Estimates are submitted, year after year, there must be a tendency to dispense with what appears to be the least important, and it is always considered that female nursing is the best, as we know it is, so that too much reliance has been placed upon that, and that may have been the reason why we have been unable to obtain an increased number in the *personnel* of the R.A.M.C.

(Q. 11,320.) But with a view to expansion in war time, what you call maintaining an increased number in time of peace is not the only possible solution, probably? The larger the number that you have enlisted the larger reserves you will get.

(Q. 11,321.) Obviously; but with your experience now of the war in South Africa, can you not think of other methods of expansion? You probably have considered other methods, besides merely adding to the number in time of peace of the R.A.M.C.? We did utilise very largely the Militia Medical Corps and the St. John's Ambulance Brigade. . . . Since the war all these branches have been increased. We had only five Militia Companies, now we have nine, and if we can get the money voted, we shall have more. The Volunteers also have expanded, because of the increased interest which the war has created.

(Q. 11,324.) Then will you go to the fourth head of your *précis* now, that men are not expected to be well trained? I think just what I said before. It is a fact that there are a very small number of men who possess training as nurses in the United Kingdom, and of those the greater number are really our own men, and therefore they do not exist—I mean are not available—for recruiting purposes. They are very good hospital attendants for first aid to the wounded, stretcher drill and ambulance drill. We are not satisfied with them to take the places of nurses in the hospital. We are now increasing their training, and it is intended to select the best and make them a nursing section, which shall do nothing but nursing. This suggestion came from the Nursing Board. The third-class orderly does very little except ordinary ward work under the sister. The majority of our hospitals are small ones at *depôts*, where nursing sisters are not employed—and a highly-trained orderly goes to them, where he will not need to be looked after by a sister. Every third-class orderly is competent to look after a man if he is sick and change his bed-linen, &c.; but if I were dangerously ill I would prefer to have a sister, of course. . . . A man would not become a first-class orderly under eighteen months or two years' service. . . .

(Q. 11,349.) Will you describe the whole thing (training)? On enlistment an orderly is sent to the R.A.M.C. *depôt* at Aldershot—he is clothed, and is put to learn the ordinary soldiers' drill and stretcher drill—afterwards he attends lectures on the rudiments of

anatomy and physiology, first aid to the wounded, ambulance classes, treatment of fractures and wounds, poisons and accidents—the course lasts about six months. They go to the hospital and receive lectures from the nurses—being taught the administration of medicines, preparation of diets, drinks and foods, the nursing and handling of patients. Then they are stationed at the large hospitals, where they are under the training of the doctors, ward-masters and sisters, and they are trained there. These hospitals are at Aldershot, Woolwich, Netley and Shorncliffe. At Netley the orderly gets a good deal of experience, because all the Indian invalids and the great majority from South Africa go there. There is a good deal of surgery there. At Aldershot he gets experience of enteric. Such experiences are not comparable with that gained by a nurse in an Indian hospital. An orderly probably comes out at his best in a station where there are no sisters, when he learns more to rely and depend upon himself. . . . In October, November and December, 1899, we sent out 2,200 men; in 1900, 3,660 men; in 1901, 1,794 men; and in 1902, up to September, 836, making a total of 8,490, and at the commencement of the war the whole Corps was only 3,000 strong. Out of that very large number you could not expect them to be all equally trained as competent nurses; although they did very well as stretcher bearers, for the application of first aid, and for doing the rough routine work of a ward. It would be hardly fair to test the results in South Africa, and to say they represented the R.A.M.C. as a general rule, because *barely a quarter of those men were really trained R.A.M.C. men.*

(Q. 11,398.) The Director-General has made a proposal to increase the numbers? He does so regularly for every year. . . . A certain number have been given, but not the amount hoped for; the fighting man must come first.

The Army Nursing Service Reserve is the reserve of nurses. It consists of nurses who have signed a contract to serve at home or abroad, in time of national emergency—they must have had three years' experience. We sent out over 800. There were 900 altogether at one time—others having come from Canada, Australia, and some were locally engaged. . . .

Before a man is advanced from one grade of orderly to another he passes an examination, one of the things being a nurse's report—the thing we lay the most stress upon is his nursing capacity—and capability of imparting that knowledge to others. . . .

It would be a good thing indeed if the Russian system of treating civilians in the military hospitals could be adopted here, both for doctors, and nurses, and orderlies; but I fear it is not likely. . . .

The average number of R.A.M.C. men out in South Africa at one time was about 4,000, and if you count regimental orderlies, there were 2,000 more locally enlisted. That was just one-half the number considered necessary.

The qualification required from those sent out during the war was :
“ They must produce written evidence, satisfactorily to the medical officer who examines them, that they possess a fair knowledge of ambulance and nursing duties, such as certificates of proficiency in first aid, ambulance and nursing, from recognised corps, institutes, or societies ”—practically first aid.

We got very good men for binding up wounds, dressing fractures, or carrying men on stretchers ; but they were not qualified in nursing men with typhoid fever.

End of Lieut.-Col. Wilson's evidence.

Reviews.

CENTENARY MEDICAL REGULATIONS.

By Lieut.-Col. W. G. DON, M.D.

Hon. Deputy Surg.-Gen. (Retd.)

I HAVE much pleasure in presenting to the Royal Army Medical Corps, a copy of the Army Medical Regulations of 1799, a book, now very rare, which was given to me years ago by my old comrade, Deputy Surg.-Gen. C. G. Irwin. One of my earliest P.M.O.'s told me these same Regulations were in force during his service in the Peninsula and at Waterloo, and they probably survived until displaced by Sir James McGregor's Regulations, which lasted from the twenties to Crimean times.

The changes involved in Sir Sidney Herbert's great Warrant of 1858 introduced an extended code, embracing Regimental, General and Field Hospitals and Military Hygiene, which continued until the issue of the "Unified" Regulations of 1878, the work of Munro and McNalty; these, in turn, were displaced by the much fuller Regulations of 1885, which were called into being through the disciplinary command of the Army Hospital Corps passing from the officers of orderlies to the medical officers.

Of these latter Regulations, which have formed the basis of all subsequent editions, I may speak with both knowledge and feeling, as being largely my own handiwork; for while in the War Office it fell to me, as editor, to revise, recast and rewrite the issue of 1878, in conjunction with Col. W. Johnston, C.B.; an honour in its way perhaps, but no pleasure, for it was a very tough job!

Such, briefly, have been the various emissions of medical regulations during the past century, which have appeared concurrently with the progressive evolutions in the Army Medical Service itself. Regulations must change with every change in the service, so that there is no finality in them; nevertheless, I cannot but think that those now in force are not likely to be materially altered, far less superseded, for many a year.

I will endeavour to review, shortly, these centenarian regulations, which are of more than mere archæological interest to a younger generation of medical officers, because they not only disclose the system and rules under which our predecessors worked a hundred years ago, but afford suggestive examples of the then stage of medical and hygienic knowledge, as well as giving insight into the status of the medical officers, which in our time has been a burning question.

From what I can gather, the Regulations of 1799 were the first that were issued in consolidated book form, for previously regimental hospital administration was loosely based on disjointed and clashing army orders and sententious military circulars, which secured no uniformity.

The little consolidated booklet before me is a limp paper-covered volume of 53 pages, with a few attached tables and forms for returns, but it displays, in such limited space, an intimate acquaintance with

regimental economy and needs as then existing, and gives sound, if empirical, injunctions on various hygienic and sanitary matters. I can merely give a sketch of its more interesting contents, emphasising points which may be compared with latter-day evolutions. The booklet is labelled outside, "Regulations for Improving Regimental Hospitals," with the emphasis, no doubt, on the word improving. Inside, this preamble becomes "Regulations to Regimental Surgeons, &c., for the Better Management of the Sick in Regimental Hospitals. London, 1799, J. Jones, Printer, Chapel Street, Soho." The emphasis here falls on the *et cetera*. On another fly-leaf is a further heading, "Regulations from the Army Medical Board to Regimental Surgeons, &c., Referred to in the Foregoing." The *et cetera* again appears here, but the chief point is that army medical administration was then in the hands of a Board, which also, when it included an "Inspector of Regimental Hospitals," was spoken of as the "Medical Staff," disclosing the fact that the hospitals were subject to departmental as well as regimental control.

The Regulations were issued in September, 1799, by Harry Calvert, Adjutant-General, prefaced by a strongly worded order of His Royal Highness (the Duke of York), Commander-in-Chief, which "hereby enjoins Commanding Officers of regiments of every description, and all Regimental Surgeons, to govern themselves in their respective duties touching the care of the sick soldiers, and the management of Regimental Hospitals in strict conformity thereto." The *et ceteras* of the preambles are here revealed as Commanding Officers, and this imperative order was designed and needed to enforce greater uniformity, as well as to lessen friction, between medical and military authority; for the hospitals being usually farmed, through money grants (chiefly stoppages), more or less conjointly by Commanding Officers and Surgeons, friction arose through a dual management. Moreover, there were then doubtless, as in later years, Commanding Officers who resented the limited autonomy which the Surgeon exercised, and grudgingly recognised medical regulations. I remember one such who, in 1860, when his attention was called by the regimental surgeon to a hygienic matter in the new Regulations of 1859, curtly replied, he did not recognise these Regulations, which had not been supplied to his orderly room, and consequently could be no concern of his.

The Regulations of 1799 were drafted by the three members of the Medical Board whose signatures are appended: L. Pepys, T. Keate and J. Rush, without either stating medical qualifications or military rank. Doubtless they possessed both, but even had the highest departmental rank followed their names, it would not have guaranteed that they were seniors who had risen through the lower ranks; for in those days patronage and nepotism were so rampant and unashamed that pure civilians were sometimes pitchforked into administrative positions with no service in the junior ranks; a system of promotion, it is needless to say, most unjust and fatal alike to honest emulation and hopeful service in the executive ranks. Between the Central Board and the scattered regimental surgeons the only intermediary appears to have been the "Inspector of Regimental Hospitals"; a solitary official, for there is no trace of district principal medical officers.

The Regulations are tersely written in chapters, but not num-

bered paragraphs. They afford plenty of evidence of the army status of the surgeon and his assistants; only twice are they called "medical officers," and are once referred to as "medical persons," but this curious designation was probably employed to include a junior rank, named "Hospital Assistants," which disappeared about 1829, and who were often unqualified, therein corresponding to the "Doctors' Mates" in the Navy. Each regiment had a surgeon and one or more assistants, just as down to the days of unification; and, needless to say, their regimental experiences varied. In some regiments the life of the surgeon, like that of the policeman in the song, was "not a happy one." But such unhappy cases were fortunately rare, for many retired medical officers can, like myself, testify that their happiest days of service were spent in regiments, and there were instances where the old surgeon ultimately became the father of his regiment, and was so regarded. Perhaps the most unique example of this was that of my good friend Deputy Inspector-General Thomas Mostyn, a Peninsular and Waterloo veteran, who, as assistant and surgeon, served continuously in the 27th Inniskillings from 1811 to 1857, refusing promotion on the staff, and finally only severing connection with his regiment when advanced years rendered him unable to accompany it to India in mutiny times. When H.R.H. the Duke of Cambridge learned the facts of the case, he at once ordered that Mostyn be promoted to 1st Class Staff-Surgeon, and made P.M.O. at the Curragh. In a purely military sense the old regimental surgeon was quite subordinate, never rising above the relative rank of Captain, except in the Guards, where were Surgeons-Major; but he possessed, through the power of the purse, certain autonomous functions which conferred a regimental standing perhaps superior to that of his successor in Crimean days.

These old Regulations lay down that the professional (and purveying) efficiency of the surgeon is to be judged by reports and Journals, thus: "The reports of the visiting officers (officers of the day) and of the surgeon will afford such information to the Commanding Officer as will satisfy him, with the help of his own occasional visits, that the sick are diligently attended to and humanely treated." Further, "The Journals (Case Books and Dietary Returns) kept by the surgeon will be undeniable proof of his diligence, and the best proofs of his professional ability." We may demur to such a test, but the standard here set up was considered infallible for many a day, and was the true origin and cause of the writing of voluminous case-books, to which the older-fashioned race of Inspecting Officers invariably turned; less to read and estimate the merits of clinical dissertations than to compare and if possible discover discrepancies between the extras of the diet sheets and those entered in the books. So, too, when daily notes on trifling cases receiving small extras were insisted on, the results were sometimes curious; as in the story of the perplexed medical officer, who, in desperation for something to record on a gonorrhœal case, gravely wrote, "relished his barley water."

It will hardly be credited how useless old hospital records were cherished and carried about by some regiments. When I joined the 28th regiment in India early in 1859, the hospital baggage was swollen

and encumbered by a cartload of thick sheep-skin bound old case-books, going back forty years. This folly was shortly after put an end to by an order for the destruction of all such impedimenta; but while these musty old volumes were with us their perusal was a source of amusement, at the expense, I regret to say, of the writers, most of whom were in their graves.

The centenary surgeon had, in theory at least, a fairly free hand in the formation and management of his hospital, although under command in two directions, thus: "All regimental hospitals are under the immediate direction of their respective Surgeons, subject, nevertheless, to the general directions of the Inspector of Regimental Hospitals . . . who will propose to the Officer Commanding Brigades or Regiments such regulations as they may consider to the benefit of the sick."

The Surgeon was thus generally between two fires, and had no doubt often to exercise tact and *finesse*. The powers of the Inspector were plenary; to see that the Regulations were strictly conformed with; to ascertain wants and defects; to listen to complaints of the patients; and, above all, to tender advice, when necessary, not merely to surgeons but to Commanding and Divisional Officers.

The very specific instructions relating to hospital accommodation probably often proved quite impracticable, from the fact that no special hospital building existed in barracks, and only such ordinary barrack-rooms as were available were allotted as wards by the "Barrack-Master-General."

Those who have seen old barrack-rooms can judge of their unfitness as improvised hospitals; besides an habitual over-crowding, ventilation was very defective, rooms were noisy, cold and comfortless; isolation of cases was effected only by suspended blankets round the cots; close stools were all about; filthy night urine tubs at the door, for the only alternative to their use was going out in the cold to the primitive latrines in the barrack yard.

But in those days troops were often not housed in barracks at all, but billeted up and down in all sorts of places, in neighbouring towns and villages, which necessitated the provision of another kind of improvised hospital, thus: "Every Regimental Surgeon, or, in his absence, the Assistant Surgeon, is to provide an airy, roomy and healthily situated regimental hospital, where good water can be procured"; or, if encamped, "a hospital tent is allowed in aid of a hospital, but, except in cases of absolute necessity, is not to be made the sole hospital." All this was much more easily said than done in most country places.

Very practical and sensible instructions are laid down on the sanitation of hospitals, whether in barracks or barns, as regards ventilation, scrubbing, whitewashing and disinfecting, but probably they were quite impracticable in many of the improvised hospitals.

Similar instructions are given for airing and disinfecting bedding and clothing, by heat, steeping and washing, supplemented, "when contagious or putrid distempers prevail," by fumigation with "the nitrous vapour"; while the sufferers from such distempers must be isolated in separate buildings or tents.

Such terms as cubic space and superficial area were apparently not used or invented a century ago, but the conditions they express or

imply were clearly appreciated, for in the appropriation of wards it is enjoined, "The hospital is never to be crowded, every man to have at least the space of five feet allotted to his bed, and " (odd as it may seem) "every man a bed to himself"!

The segregation and isolation of patients suffering from "infectious diseases, putrid fevers, fluxes, small-pox and measles" are well provided for; while rules for the treatment of "itch" are very explicit, an affection in days of promiscuous billeting and quartering exceedingly common and troublesome. Lastly, "All men with the venereal disease are to be confined to hospital," a rule, we would think, that might have gone without saying.

It will be with mixed feelings that the younger generation of medical officers read, "Punished men (flogged) should be placed in a separate ward, and their linen and bedding frequently changed."

The most onerous, and perhaps invidious, of the duties which devolved on the old regimental Surgeon was that known in the Regulations as "Subsistence," whereby he was his own hospital purveyor; the duty was no doubt lightened if he had a trustworthy Sergeant to help him, but was at best exacting.

The system of hospital-farming, like colonel-tailoring, through money grants, was fraught with potential abuses, and fostered in the soldier's mind the suspicion that he was being done somehow; it was cheap for the State, but bad for the Service. The State had still, of course, to provide hospital equipment and certain stores, but the sick soldier himself practically paid for his subsistence in hospital through heavy stoppages, which passed through the Surgeon's hands, subject, however, to most searching audits. The Regulations provide that "The sum of four shillings per week from the pay of each soldier will, under proper regulations and with strict economy, be sufficient." For what? In order that "the sick soldier should be provided with every reasonable comfort and indulgence that can be afforded"; and to have "bread made of the finest wheat flour, and fresh meat perfectly good and wholesome." How such a miracle was wrought for the sum of about sevenpence per head per day we may never know, but it had to be done under stringent regulations. "That the greatest economy may be used in laying out the money for the sick, every article ought to be purchased by the Surgeon, who is required to keep a book in which he is to enter the most minute article, on the opposite page of which book he is to enter the amount of the weekly consumption of each man according to the diet table . . . and this book, with the diet table, is to be laid before the Commanding Officer and Paymaster every week, to be examined and signed by each; and it is of the utmost importance to the welfare of the soldier, and his Majesty's Service, that every Commanding Officer and Paymaster of a regiment should superintend the expenditure."

This was pretty strong regarding the heavier articles of subsistence, but how about "Extras?" These were usually, but not always (they were sometimes paid for through money grants) direct Government charges, and were, therefore, only to be given under stringent and purposely difficult rules. They were to be prescribed "as long as the case absolutely requires it, and no longer." And further, in the case of wine (spirits not mentioned) "it must be given by the Surgeon or Assistant Surgeon himself,

unless previously mixed by them with medicines, foods, &c." As the actual administration of wine by the medical officers themselves was next to an impossibility, they naturally took shelter under the latter part of the order; and to prevent purloining or misappropriation, as I have heard, sometimes mixed it with the most nauseous drugs in the dispensary, so that the veriest dipsomaniac old soldier regarded it with loathing!

The hospital stoppages were very heavy, and were instituted, as I have been told, with a double object. First, to run the hospitals with as little expense as possible to the State; and secondly, to penalise sickness at the soldier's cost, and thus stop malingering, which was a common and serious crime in the days of long or life service.

Hospital beds were provided a century ago, on the familiar 4 per cent. of strength, as quaintly expressed: "A regiment consisting of 1,000 men, and provided with three *medical persons*, ought to be furnished with hospital necessities and utensils for at least forty patients." The equipment allowed for that number was somewhat scanty, and it is curious to note the patients were evidently expected to be chiefly spoon-fed; for, while there is a spoon for each, only one dozen knives and forks are allowed for the whole forty.

The old surgeon was not burdened with many purely medical returns, which comprised two only—a Morning State for the Commanding Officer, and a Monthly Return for the Medical Board, rendered through the Inspector. The grouping of diseases in the latter return is curious, thus, fevers, pulmonic cases, dropsy, venereal complaints, fits, tumours, &c.

Every half-year the Surgeon also rendered to the Inspector two Returns, one showing "the situation, size, rent," &c., of the hospital, if hired, together with an abstract of the "contingent expenses" connected therewith, supported by vouchers certified by the Paymaster; the other, a Return of Medicines expended during the six months, "accompanied by an affidavit taken before a Magistrate, that none of the Medicines have to his knowledge been converted to private purposes, or applied to any use but that of the Regiment, or some other military service, for which he must produce the special orders of the Commanding Officer, or of the Inspector of Regimental Hospitals."

Although, therefore, the Surgeon had power, and even discretion, in the expenditure of public monies, he was met at every turn by checks, vouchers, audits and affidavits.

The Tables given for an "Army Dispensary," and a "Regimental Medicine Chest," reflect the *Materia Medica* of the time; drugs are usually named in a crude state, and classified according to real or supposed therapeutic virtues; thus, vomitum cientia (causing, or provoking), urinam cientia, sudorem cientia, &c.

There is, of course, no mention of vaccination in these century-old Regulations, for Jenner's discovery of 1796 had been little more than announced when they were drafted; but the inoculation of recruits is enjoined, when convenient, but never to be carried out in barracks or hospitals.

The kind of examination a recruit underwent a century ago (or, indeed, much more recently) may be inferred from the injunction that no man is to be certified "fit to serve who has not at his examination been stripped of all his cloaths"! The furniture of the inspection room of the period

consisted of little more than a writing table and a couple of chairs, for standard measurements devolved upon the recruiting and not the medical officer; and, indeed, it was only in 1879 that the latter became responsible for them.

When I entered the Service and was stationed in Dublin, I was sent to the Linenhall Barracks to gain insight into recruiting under a very old medical officer, who evidently followed the method of examination he had learned, probably, at the time of Waterloo; his procedure was as follows: The recruits of the day were stripped of all their "cloaths" and paraded in line, when a primary inspection by perambulation in front and rear was made. All who presented obvious external defects fell out and were summarily dismissed; the likely recruits were then examined individually, in much the same manner as at present; the examiner's hand was laid over the man's heart, and the pulse felt to discover palpitation or irregularity, for he had no stethoscope; vision was tested, at about a dozen paces, by the examiner making the recruit count the number of fingers he held up, or he was taken to the window to view more distant objects; then came a declaration as to "fits," and the man was passed or rejected. Many men with disabilities, especially cardiac affections and defective vision, must have slipped through under such an examination.

Lastly, come the "Attendants" in an old regimental hospital, who, in the absence of a medical corps, were drawn from the regiment itself. They were normally three in number—the "Sergeant," the "Orderly Man," and the "Nurse." The two latter were necessarily increased when sickness was heavy.

The "Sergeant" was expected to be at once a factotum and a paragon, and happy the Surgeon who had one answering the description! My own experience of the old hospital Sergeant was that he was usually one of the best Non-commissioned Officers in the regiment, a model man, who, besides wielding disciplinary functions, was at once steward, wardmaster, and nurse. The centenary sergeant, for such multitudinous hospital duties, received the handsome allowance of 6d. per day, paid half yearly, so that he could be mulct in deductions for negligent loss of stores.

The "Orderly Man" was also a factotum, from scrubbing, cleaning and cooking, to nursing, and performing the last offices to the dead. I remember one who, under my own training, became really expert at *post-mortem* examinations. His allowance a century ago was 4d. per day.

The "Nurse" was not less a model, for she is described as "one decent, sober, woman nurse, who shall receive at the rate of one shilling per diem, whose duty will be to prepare the slops and comforts for the sick, and occasionally to assist in administering medicines, cooking the victuals, washing, &c." Her duty was thus towards men, not to her own sex, for there is not a word about soldiers' wives and families in these Regulations.

In reviewing these old Regulations, I have ventured to intersperse, by way of illustration, some personal reminiscences, which I hope may interest a younger generation of medical officers; in so doing I plead the privilege of age, having lived and served as well under the old regimentalism as the newer unification, and being familiar with both.

The immense advance of our Service since 1858 towards a higher status and increased efficiency arouses sincere congratulation; but let not

complacency assume that, therefore, our predecessors of fifty or sixty years ago were discontented and inefficient under the old order of things; it was not so, rather did they their duty well according to their lights, and did usually so manage to adapt themselves contentedly to their environment as to exemplify and fulfil the wisdom of the adage, "Sufficient unto the day," &c.

THE LAWS AND CUSTOMS OF WAR ON LAND, AS DEFINED BY THE HAGUE CONVENTION OF 1899. By Professor T. E. Holland, K.C. London: Printed by Harrison and Sons, St. Martin's Lane, 1904.

The preface states that, "In compliance with the undertaking contained in Article 1 of the Convention, signed at the Hague on the 29th July, 1899, the Regulations respecting the Laws and Customs of War on Land, annexed to the Convention, are published in this handbook, for the information of all ranks of His Majesty's land forces. The articles of the Geneva Convention of 1864, and the Declaration of St. Petersburg of 1868, are also reproduced in order to complete the work."

The author, in his introduction, states: "The object aimed at in this handbook has been to set forth, in an orderly sequence, for the guidance of British troops, the rules of international law, applicable to the conduct of warfare on land.

"Such rules, as is shortly explained in the opening articles of the handbook, existed, till a comparatively recent date, only as customs preserved by military tradition, and in the works of international jurists. Their authority was derived from the unwritten consent of nations, as evidenced by their practice. Many of the so-called 'laws of war' are still of this character.

"But within the last forty years the greater bulk of the rules in question have been expressed in written agreements, to which most civilised powers have become parties. The instruments in which these agreements have been recorded are known as the Geneva Convention of 1864, the Declaration of St. Petersburg of 1868, and the Hague Convention of 1899, which, incorporating as it does the two former acts, may fairly be regarded as being, so far as it goes, an international code of the laws of war on land.

"Though thus comprehensive, the code is, however, far from covering the whole subject. On some points the nations are not yet in agreement, and there will probably always continue to be a residue of questions, the answers to which will hardly admit of being stereotyped in a written document.

"In this handbook articles expressing the still unwritten or customary laws of war, as derived by the compiler from the most reliable sources, are printed in large but ordinary type.

"Articles reproducing textually the three above-mentioned conventional acts are printed in large black type.

"Explanatory comment in a smaller type is added to such articles as seemed to require it.

"Some illustrative matter, historical and diplomatic, will be found in the Appendix."

This handbook should be of great value to Majors of the Royal Army Medical Corps coming up for examination in this subject. D. B.

STRETCHER DRILL (Illustrated). Second Edition. By Major J. J. de Zouche Marshall, R.A.M.C.(Vol.). Printed at the office of T. W. Childs, at 10, Broad Street, Teddington. Price 3s.

We have received a little book on Stretcher Drill, by Major J. J. de Zouche Marshall, R.A.M.C.(V.), which will prove most useful to those who wish to learn stretcher drill. It will doubtless be very handy to the large number of medical officers of the auxiliary forces, who have to make themselves acquainted with the drill, and who have not the advantage of attending a course of instruction at some ambulance school of instruction.

The book contains not only the drill taken from the Manual of the Royal Army Medical Corps, with a number of plates from the same manual, but several original diagrams, which help to make, what to some is a rather complicated drill, explicit. The author has also added some extracts from Infantry Training, such as definitions, sizing, and the formation of fours; rules for the inspection of recruits; extracts from the dress regulations; scale of pay, allowances and promotions in the Royal Army Medical Corps, and the articles of the Geneva Convention. These, we think, Major Marshall, in a future edition, might with advantage arrange in a more satisfactory order. For instance, the author has placed his description of the formation of fours at the end of the book, after the Articles of the Geneva Convention, as if it were an after-thought, whereas anything pertaining to infantry drill should come before the stretcher drill.

The usefulness of the book would be much increased were more extracts from Infantry Training added, and some of the other matter omitted. We have thought for a long time that for officers of the auxiliary forces a book containing that part of infantry training devoted to squad and company drill, a knowledge of which is essential before learning stretcher drill, together with that portion of the Corps Manual which contains drills and exercises, would be most handy. There are a few corrections required in the text, but these will doubtless be made in a future edition. As a whole the book contains, for its size, a quantity of useful information, which cannot fail to be of service to officers of the auxiliary branches of the corps. Major Marshall is to be congratulated on his successful effort, another proof of his well-known enthusiasm. The book is published by the author at Shortwood, Teddington, Middlesex, at the price of 3s.

F. J. G.

Current Literature.

Recent Researches regarding Tetanus.—The experimental results reported by Ransom and Meyer in the *Proc. Royal Soc.*, July 8th, 1903, affords some explanation of local tetanus and the period of incubation as well as a theory of the action of tetanus toxin and a definition of the sphere within which the serum treatment of the disease is effectual. The authors, on the basis of the following experimental proofs, claim to show that the toxin of tetanus only reaches the central nervous system by way of the motor nerves: (1) toxin was found in the motor nerve after subcutaneous injection in a hind leg; (2) the spinal centres can be protected if the toxin be prevented from passing along the motor nerve by the injection of antitoxin into the substance of the nerve; (3) if a lethal dose of tetanus toxin be injected into the sciatic nerve of a cat, the first symptom is a local tetanus of the muscles of the injected limb. Then follows a progressive passage of the disease from the hinder to the fore parts of the animal which, under certain conditions, can be prevented by the section of the spinal cord; (4) a dose of toxin, which, if given hypodermically, causes no symptoms, is often sufficient to cause death if injected into a motor nerve; (5) even when the blood contains much antitoxin, it is possible to produce tetanus by injecting toxin into a motor nerve which, if given subcutaneously or intravenously, would give rise to no symptoms.

As regards the incubation period, the authors consider this to be but an expression of the time occupied in the passage of the toxin from the periphery to the susceptible centres along the motor nerves. When toxin was injected into the substance of the spinal cord, the authors observed a primary sensory disturbance which remained strictly localised, even when muscular rigidity and the exaggeration of reflexes was becoming general. This symptom of extreme hyperæsthesia of some part of the periphery corresponding to the spinal centre into which the injection of toxin had been made, never occurs if the injection be made hypodermically or intravenously, nor after administration into a nerve trunk. To this condition of over-irritability of the pain-reflex apparatus they give the name tetanus dolorosus; they further find that it results absolutely when the toxin is injected direct into a posterior root, a fact they interpret as indicating that the spinal ganglion forms an insuperable obstacle to the transport of the toxin, or, in other words, the pain apparatus in the spinal cord is so insulated from the motor that an intoxication of the one group cannot pass over to the other.

The actual movement of toxin in the nervous system takes place in the protoplasm of the nerves and not by the lymphatics. The theory of tetanus intoxication is to the effect that the toxin is taken up from the point of injection by the motor nerves; passing along these, it reaches the first motor centres in the cord and excites there an irritability, so that the discharges, which in the normal only give rise to mere muscular tone, become abnormally strong. The excess toxin is next carried in the fibres

of the cord to the motor apparatus of the corresponding limb of the other side. Later, and if enough toxin has been given, the nearest connected sensory apparatus of the reflex arc in the cord is attacked, resulting in general exaggerated reflexes. The authors found that when tetanus toxin was introduced direct into a motor nerve, antitoxin, though in excess in the blood, was unable to prevent the outbreak of the disease or hinder a fatal issue. They infer from this that, even in highly immunised animals, the nerve tissues remain free from antitoxin. If this is so as regards the value of serum treatment in tetanus, any toxin which may be in the nerve substance, though perhaps not in the cord, cannot be reached and neutralised by antitoxin, whether given intravenously or hypodermically. An attack corresponding to the quantity of toxin absorbed by the nerves is certain to follow and run its course in spite of antitoxin. On the other hand, any toxin in the blood and lymph will be neutralised by an injection of antitoxin, the absorption of fresh toxin from the point of infection hindered, and by this means an otherwise fatal result prevented.

R. H. FIRTH.

The Estimation of Boric Acid in Milk.—In the *British Food Journal*, 1902, iv., 210, Cassal and Gerraus suggest a colorimetric method, based upon the formation of a magenta-red colour, which the authors find is produced when solutions containing boric acid are evaporated to dryness after the addition of turmeric and oxalic acid. For the estimation of boric acid in milk, from 15 to 20 grammes of the latter are rendered alkaline with barium hydroxide and evaporated to dryness in a platinum basin on a bath at a temperature of 100° C. The residue is cleaned, acidified with hydrochloric acid and extracted with hot water, the extracts being filtered into a 100 c.c. flask. The filter paper and contents are made alkaline with barium hydroxide, ignited and extracted with acidified water. The total extract is then made up to 100 c.c.; 10 c.c. of this solution are mixed with 10 to 15 grammes of clean sand in a porcelain basin; the mixture is made alkaline with barium hydroxide and evaporated on a bath. The dry residue is rendered just acid with hydrochloric acid, 2 c.c. of a saturated oxalic acid solution and 2 c.c. of alcoholic turmeric solution (1 gramme to a litre) are added, and the mixture again evaporated. During the evaporation the basin is covered with a funnel, the stem of which is connected with a set of potash bulbs containing barium hydroxide solution, a current of air being aspirated through the apparatus until the mass in the basin is dry. The colouring matter formed is then extracted with successive quantities of alcohol and filtered. The solution in the potash bulbs is separately evaporated, after neutralisation, with oxalic acid and turmeric solutions, the further yield of colour being dissolved in alcohol and added to the main quantity. This is then compared in a tube or vertical glass with the colour obtained from a known weight of boric acid.

R. H. FIRTH.

The Bacillus of Soft Chancre.—In the *Journal of Medical Research*, June, 1903, is an elaborate paper by Davis, giving the results of certain experiments which suggest the specific nature of the bacillus discovered by Ducrey in 1889, and by him claimed as the cause of chancroid or soft sore. The bacillus is about 1·5 microns long and 0·5 micron broad, has rounded deep-staining ends with a fainter-staining central portion. These

bacilli occur both singly and in masses, and occasionally in chains; they are to be found in the pus of ulcers and in the chancroidal buboes, while in the chancroidal tissues the micro-organism stains evenly, taking boric dyes well, but decolourising with alcohol and by Gram. These bacilli have been observed in no form of ulceration other than soft chancre. Since Ducrey first described this bacillus, it has been the subject of study by Leught, Nicolle, Griffon, Besançon, and Le Sourd, who succeeded in producing, by inoculation with a pure culture, the disease in monkeys. The author gives a series of forty cases of genital ulceration, clinically resembling chancroid, in thirty-two of which he found a bacillus similar to that described by Ducrey. Only one case of these showed a mixed infection, and in that syphilis developed later. From the analysis of his cases, Davis concludes that the organism is present in the pus of the ulcers in the vast majority of cases of chancroid, and not infrequently in that of the buboes. He says that it may be identified by its morphology and staining reactions, together with its inability to grow on ordinary culture media. Characteristic growth in a pure state is best obtained in a medium of fresh blood and bouillon. Inoculation in monkeys reproduces the lesion from which the original organism can be recovered. The author details certain cases from which he obtained the same micro-organism in pure culture from extra-genital sites, notably the hands. Clinically, these lesions were chancroids, and he lays stress on the importance of bacteriological examination of ulcers of this type as being likely to establish a greater prevalence of extra-genital chancroid than is generally suspected.

R. H. FIRTH.

Desertion and Absence without Leave.—That this subject possesses considerable interest for German Army Surgeons is shown by the length of an address delivered by Chief Surg. Dr. E. Stier, of Berlin, and reported in the *D. Militärarzt Zeitschrift*, April, 1904. After alluding to the erroneous belief that the majority of deserters are actuated by a desire to escape from irksome duties, and adopt a preconceived plan, Stier refers to the distinction in the German Military regulations between desertion and absence without leave. The intention of the man has to be discovered and taken into account.

He next considers the motives which are not so obvious as might be supposed. A large proportion of deserters return voluntarily; they know that their absence will be discovered, and yet in many cases the offence, though always punished, is committed twice or thrice, or even more often. The course of action is decided by sentiment, and not altogether by ideas. In the fortress-prison at Cologne, during more than a year, several hundred deserters were questioned as to their motives. Stier believes that in the majority of cases the true motives were discovered. The results of his investigations may be thus summarised. The first and most numerous category includes those actuated by a longing for some distant object; this comprises a smaller group, in which the desire is of a sexual character. In such cases the consequences for the soldier are often slight; after two or three days' experience the man returns to duty, but the offence is liable to be repeated, and the punishment is then severe. The number of deserters from this cause is particularly large in spring and early summer. Home sickness is another cause of desertion, and often

acts in combination with the one just mentioned. These deserters, wearing their uniform, rush home as fast as they can go. After a few days they usually return to barracks. Another offence, viz., overstaying leave, has often a similar causation.

The question as to the part played in these cases by mental disorders is not easily answered. In France the tendency is to regard nostalgia as a symptom of disease; but such is not the case in Germany. In the current instructions for French Military Surgeons persistent nostalgia is mentioned as a disease. During recent years there has been a decided diminution in the number of cases. Where really morbid nostalgia exists, it is almost always associated with melancholia, hypochondriasis, or other forms of mental disease. Another category, somewhat sharply marked off from those already mentioned, comprises men who have no distinct object in deserting. Actuated by indefinite impulse, but without any plan, they run away, and eventually reach their old homes. Such cases form a most interesting group; some of them have been connected with well-known morbid conditions, but there is still a remainder upon whom attention has been concentrated, because of their military and legal importance. Charcot and Duponchel attempted to assign a definite name to this condition. Donath called it "*Epileptic Poriomania*"; Ernst Schultze (1903) has suggested "*Krankhafter Wandertrieb*" (morbid impulse to wander). In cases belonging neither to epilepsy nor to hysteria, conditions occur in which a person, without consciousness of any motive, without any plan or object, withdraws himself (it may be) from very pleasant surroundings. The action is due to some purely external inducement, the insignificance of which is often inversely proportionate to the number of repetitions of the offence. The attacks are distinguished from epilepsy by the absence of any real mental confusion; the shortness of the absenteeism and the good behaviour in the intervals, suffice to show that the delinquents are not ordinary vagabonds. Stier thinks that it would be a mistake to describe such attacks as "*Epileptic*." Among several hundred prisoners under sentence for desertion, he met with only one case in which epilepsy was the cause, and with two cases attributable to "*morbid impulse to wander*." The terms "*epilepsy*" and "*epileptic*" must not be too freely applied, or confounded with weak-mindedness. Among 22 deserters pronounced by the Austrian Health Committee unaccountable, because they had committed their offence while in a peculiar "*epileptoid*" condition, no fewer than 20 showed signs of defective intelligence.

It is difficult to estimate the part played by hysteria in causing desertion. There is, however, another symptom, viz., nocturnal incontinence of urine, often met with among deserters, and hitherto insufficiently appreciated. The majority of deserters described as "*epileptic*" or "*epileptoid*" suffer from this ailment. Among 21 cases of nocturnal incontinence in the Cologne prison 14 were deserters. The sense of shame caused by the complaint, and the jeering of comrades, may account for desertion, more or less obviously devoid of any plan.

Another and a more numerous category includes men whose feeble-mindedness accounts for their desertion. They are unequal to the requirements, mental and bodily, of military service; they are objects of derision to their comrades, and serious obstacles to the proper training of the companies to which they belong. Such men become irritable and

despondent; the reasons they usually allege for desertion are almost always the same; "military service does not suit me," is the almost invariable answer. They are often illegitimate and the progeny of diseased parents, and, perhaps, brought up in workhouses. They are useless for military service, and soon commit offences for which they are sent to prison, where their mental condition often goes from bad to worse. In the Cologne fortress-prison last year, of the prisoners discharged owing to mental disorder, more than one-half consisted of men belonging to the class just described.

Strolling players and hawkers are very undesirable additions to the Army. They rarely acquire clear notions of discipline and order, of duty and serious work. Accustomed to wander about the country, they soon try to return to their former life.

The last category comprises men led astray by masterful comrades and drunkards, whether habitual or occasional. Cases of the latter kind are only too common, and require no special notice. Most of such deserters return to barracks, but some escape across the border.

Stier gives the following statistics of deserters and absentees without leave, classified according to their motives; 25 per cent. are actuated by sexual desire; 20 per cent. by nostalgia; 2 per cent. by some indefinite impulse (epilepsy, hysteria, morbid impulse to wander); 15 per cent. are intellectually or morally deficient; and 35 per cent. are drunkards. In the remaining 3 per cent. are found cases of decided mental disorder, and a few others that can scarcely be classified.

Stier gives an interesting account of the life and subsequent history of such deserters as are not brought back by their friends, or voluntarily return to their duty. Having no papers, they soon fall into the hands of the authorities. A few old and experienced vagabonds, provided with forged documents, wander about Germany until some new crime restores them to military jurisdiction. If they succeed in crossing the border, they get on best in Sweden and Norway, where they can do as they like. The next most convenient places are Denmark, Holland, Austria and Italy, whence they are almost always extradited. In Belgium, if found destitute, they are escorted to the border, where they are certain to fall into the hands of the German police. A still worse fate awaits them in France and Switzerland. In the former they are almost invariably caught up by recruiting officers for the Foreign Legion. By dint of persuasion, often having been well plied with liquor, they sign an agreement binding them to serve for five years. They atone for their previous behaviour by their experiences in the dreary garrisons of Saida and Belabes in the wastes of the Sahara, or fall victims to the terrible climate of Tonkin or Madagascar. Should they live and return to Germany, they find many old friends and acquaintances in the Cologne prison, where about 20 per cent. of the deserters confess to a similar experience. Weak-minded men are seldom admitted into the Foreign Legion; they wander from one country to another, perhaps begging in the streets, finding temporary work in circuses, markets and similar places. A few find their way into foreign armies; Stier met with men who had served in the Dutch Indies, in the Brazilian and Chilian Marine. Two others had taken part, as carriers, in geographical expeditions; one in Africa, the other in Brazil.

In the concluding paragraphs of his article Stier alludes to the two main questions which the military surgeon has to consider with regard to

deserters, these are: (1) their fitness for further service, and their accountability. The case of a deserter actuated by sexual impulse or by home-sickness presents no special difficulty. Cases of "wandering impulse" are often very puzzling, unless epileptic or true hysterical attacks have been previously noticed. It appears that even in the largest garrisons in Prussia there are no arrangements for keeping insane men under observation, but in order to determine their condition they must be sent to lunatic asylums. Cases of alcoholism usually come before the authorities on account of other crimes, *e.g.*, violent assaults.

The Army Surgeon has a very difficult task when weak-minded men, the subjects of mental degeneration, come before him. Nowhere is the border-line between health and disease so indistinct as in these cases, for in some there is mere stupidity, or youthful folly, and in others, decided imbecility or moral insanity. The question is where to draw the line marking off those fit for military service, and the line for legal accountability. A general answer may be easily given. The bounds for fitness for service should be very narrow; but those for accountability as wide as possible.

In view of recent events in the German Army, it is interesting to note that, in Stier's opinion, the obstinacy and incapacity to learn, often shown by recruits, are the causes of almost all the maltreatment which officers are provoked to inflict. It is a common delusion to imagine that thoroughly stupid and obstinate men can be educated and improved by strict discipline. At the same time to prevent such men from entering the Army, is to give a premium to depravity and degeneracy; but the Army as a whole is benefited by their exclusion. "It should not be forgotten," says Simon,¹ at the end of his excellent but too little known work, "that the ideal purpose of a standing Army is to convert our best men into a strong and reliable bulwark for our fatherland, and not to serve as a reformatory for poorly endowed, morally degenerate youths." Among the "signs of degeneration," the most frequent and important, from a military point of view, are nocturnal incontinence of urine, stammering, and left-handedness.

In conclusion, Stier discusses the position of the Army Surgeon, who has to decide whether a man who has committed an offence is or is not to be held accountable for his actions. He reiterates his opinion that the bounds of accountability should be stretched as far as possible. By sending such men to prison, a warning is given to other soldiers; and prolonged detention protects the better class of men from evil company and bad influences.

T. P. SMITH.

¹ *Ein Beitrag zur Kenntniss der Militärpsychosen, 1899.*

Correspondence.

TO THE EDITOR OF THE "JOURNAL OF THE ROYAL ARMY MEDICAL CORPS."

SIR,—Since the publication in the last number of the Corps' Journal of my paper on *Diptera*, I have had sent me a revised specimen card of entomological pins, manufactured by Messrs. D. F. Tayler and Co., Birmingham, who largely supply the English dealers in natural history apparatus. It would be as well to note that the numbers of the pins have been altered, and what used to be No. 1 is now No. 16, and No. 17 now No. 20. Will those interested kindly note this?

Either on my part or that of the printer there is an explanation needed regarding the third paragraph, page 121. What I intended to say was, that the collection of *Anopheles* larvæ is important, as Christophers and Theobald have shown that the frontal hairs on the anterior region of the head form good specific characters.

Yours faithfully,

Netheravon, Salisbury,
August 6, 1904.

N. MANDERS,
Major R.A.M.C.

TO THE EDITOR OF THE "JOURNAL OF THE ROYAL ARMY MEDICAL CORPS."

DEAR COLONEL,—The bovine trypanosome of Sierra Leone, forwarded herewith, is of some slight interest in that it has not been found in this part of the world before. Dutton and Todd, after their special search for trypanosomes in the Gambia, did not find the parasite in oxen, and reported that:—

"Cattle and other domestic animals are not known to suffer from the disease."

The animal from which the blood was obtained had been converted into beef by the owner, because it was so sick that he thought it would soon die. The slide was taken in a hurry when I was on the march and came across the people cutting up the body, so it is not very perfect, but you will be able to see if the organism is the same as that of your Nagana, or of your East African Ox. The parasite looks rather small, but I have no means of measuring or drawing it.

Glossina palpalis is, as you know, found here—it is common all over the place. My boys say, however, that there is a larger black fly, of the same kind, which "no lib nyah, he folla dem bush-cow dey hup." "Hup" means "up country"; "bush-cow" means "buffalo." Our slaughter cattle come from up country.

Sierra Leone,

May 31, 1904.

Yours, &c.,

FRED. SMITH.

NOTE.—This trypanosome is much smaller than the trypanosoma of Nagana, being only on an average 13 microns in length, whereas the latter is double that size. We trust Major Smith will further investigate this subject, and if this trypanosome should turn out to be a new species we would propose the name *T. Smithii* for it.—ED.

Journal
of the
Royal Army Medical Corps.

Original Communications.

REPORT ON ENTERIC FEVER CASES ADMITTED INTO
THE MEDICAL DIVISION OF NO. 7 GENERAL
HOSPITAL, PRETORIA.

BY MAJOR R. C. COTTELL.
Royal Army Medical Corps.

TAKING the cases as a whole, their chief points of interest appear to be the following: Constipation was the rule, even in those cases where at the *post mortem* ulceration of the ileum was shown to be very marked. Diarrhoea appeared to be confined to those cases where ulceration had taken place close to the ileo-cæcal valve, and which involved at least the commencement of the large intestines. This was proved by several *post-mortem* examinations. Thrombosis of the veins of the legs was of common occurrence during the latter weeks of the disease. In several cases it took place in both legs, and in a fair number in the right leg alone. Heart failure, accompanied, as a rule, by passive congestion of the lungs, was a common complication of the disease. I think the marked weakness of the heart's action, noticed so commonly in the early stages of the illness (even from the day of the patient's admission to hospital), was largely due to the continued over-exertion and excitement of active service, together with insufficient and often very indigestible food. Mental derangements, noticed chiefly as occurring in cases that were very emaciated. The mental condition was usually that of more or less marked dementia. The patient was noisy, as a rule,

and very wakeful and suspicious. Neuritis of the legs and arms often accompanied this condition. The brain symptoms in every case gradually passed off as the patient's bodily strength returned, leaving in the cases I saw no trace of permanent mental injury. Cases of severe neuritis of more or less definite sets of nerves occurred; those nerves chiefly affected being, in order of frequency, the nerves to the anterior tibials, the peronei, the muscles of the calf and thigh. All three were generally bilateral affections. After these the muscles of the shoulder, fore-arm and face; these generally unilateral. Severe neuralgic pain was present in these cases, followed frequently by local anæsthesia. Hyperpyrexia was a fairly frequent symptom; it was, however, as a rule, easily controlled, though in one case it was apparently the cause of death. Acute pneumonia, though stated by many local practitioners, both of the Transvaal and the Orange River Colony, to be a common and fatal complication, was not often met with. Passive congestion of the lungs, secondary to heart failure, was, however, of frequent occurrence. The usual rose spots were generally present, though they were absent in several of the fatal cases. A marked purpuric rash was sometimes present on the abdomen, back, thighs and inner sides of the arms. This rash had apparently no relation to the severity or otherwise of the attack, and was frequently still fairly visible after some weeks of convalescence. Many of the cases were verified by Widal's test, carried out either at this hospital or at the laboratory in Pretoria, under Captain (now Major) Beveridge, D.S.O., R.A.M.C.

The patients who had been inoculated against enteric fever were too few in number to allow of any statement as to its effect in the incidence or fatality of the disease. None of my patients had been re-inoculated. Taking the total number of enteric cases admitted, I find 5·46 per cent. had been inoculated. Of the forty fatal cases, two had been inoculated; both were aged 24; one died of perforation of the bowels and the other of cardiac failure and congestion of the lungs. Including the eight cases admitted in 1900 and ending fatally in 1901, the total admissions were 479.

TOTAL CASES.

Total	Duty	Invalided	Died	Per cent.		
				Duty	Invalided	Died
479	332	107	40	69·31	22·34	8·35

HALF YEARLY.

Date	Total	Duty	Invalided	Died	Per cent.		
					Duty	Invalided	Died
January to June ..	241	159	56	26	65·97	23·24	10·78
July to December	238	173	51	14	72·69	21·43	5·88

MONTHLY.

Month	Total	Duty	Invalided	Died
January	44	28	8	8
February	32	23	8	1
March	24	20	3	1
April	54	42	9	3
May	53	30	18	5
June	26	16	10	0
July	28	12	15	1
August	2	0	2	0
September .. .	17	11	4	2
October	48	33	11	4
November .. .	61	45	10	6
December .. .	82	71	9	2

AGE INFLUENCE.

Age	Total	Duty	Invalided	Died	Per cent.		
					Duty	Invalided	Died
Inclusive, 19 to 25	309	215	73	21	69·58	23·63	6·79
All other ages ..	170	117	34	19	68·82	20·00	11·18

It is possible at this date (May, 1902) to state that the total mortality per cent. of those admitted in 1901 was 6·99. This is obtained by deducting the eight fatal cases admitted in 1900, and adding the one fatal case that occurred among those remaining on December 31st, 1901; all the others in hospital on the latter date having been discharged from hospital either to duty or as invalids.

The most noticeable symptoms in the forty fatal cases were the following, in order of frequency :—

Marked delirium (29), heart failure (28), congestion of lungs (28), hyperpyrexia (over 104°, 17), perforation of intestines (7), hæmorrhage from bowels (4).

The actual cause of death in these cases (verified by *post-mortem* examination No. 24) was as follows: heart failure (unconnected with hæmorrhage, 27), perforation of intestines (7), pneumonia (4), hyperpyrexia and cerebral congestion (1), collapse following severe intestinal hæmorrhage (1).

The cause of death in the sixteen cases on whom no *post-mortem* examinations were held was apparently : heart failure (8), perforation of the intestines (4), pneumonia (3), and hyperpyrexia (1).

The average number of days in hospital of all fatal cases was 21·20. The shortest number seven, the longest fifty days. Including the cases of enteric fever among the attendants in this hospital, the total number of cases admitted from the district of Pretoria was 154. Of the fatal cases, six were orderlies doing duty in the enteric fever tents of the hospital.

Every precaution is taken to warn and help the men, but they will not be sufficiently careful, especially as to the necessity of frequently washing and disinfecting their hands. That the cause of the men contracting the disease is largely due to carelessness is to some extent proved by the fact that the sisters employed in the same tents in no single instance contracted it.

During the latter months of the year many of the cases admitted were "transfers from other hospitals," and were therefore more or less convalescent, and the disease, too, was then running a less severe course.

COLONIAL CORPS.

Although the admissions from these corps were too small to make any satisfactory comparison with the home corps, the following was noted :—

Corps	Total	Duty	In- valided	Died	Per Cent.		
					Duty	Invalided	Died
South African Corps ..	46	41	4	1	89·13	8·70	2·17
Other Colonial Corps ..	55	36	15	4	65·45	27·27	7·28

In the above table the death-rate (7·28) for "Other Colonial Corps" is probably due to the age of the patients. This is shown by taking the number of cases between the ages 19 and 25 in the "South African Corps," which was only 47·82 per cent., while in "Other Colonial Corps" the percentage between these ages reached 69·99 per cent.

The treatment carried out in my division has been very largely symptomatic, the greatest care being taken to ward off relapses by rigid attention to nursing and dieting in all cases, however mild the attack was. Heart failure frequently required the early and continued administration of hypodermic injections of strychnine. Hyperpyrexia was, as a rule, satisfactorily controlled by frequent cold or tepid sponging, and in a few cases by ice-packing. Antipyretics were seldom used.

REPORT ON AN OUTBREAK OF EPIDEMIC DISEASE OCCURRING AMONGST BETHUNE'S COLUMN AT STANGER, NATAL, OCTOBER, 1901.

BY MAJOR W. W. O. BEVERIDGE, D.S.O.

Royal Army Medical Corps.

THE column arrived at Eshowe, Zululand, on October 7th, and remained there for five days. The weather was very inclement, accompanied by heavy rain and dense mists.

History.—The first cases commenced at Eshowe, about the 11th instant, when many of the men reported sick, suffering from swollen lymphatic glands, in various situations, with mild fever (99° to 102° F.). Cases continued to occur daily until Stanger was reached by the column on October 18th, when a large number of the men reported sick, with similar symptoms, but as far as could be traced, most of them had been sick for some days previously. At Stanger the disease continued to spread amongst the troops with great rapidity, and by the 20th instant there were 325 cases under treatment. On the 22nd instant natives attached to the column were attacked by the same symptoms, 10 cases occurring on one day, the 23rd. Up to the 24th instant, out of a strength of 1,240, including natives, there were 470 cases, but no mortality resulted. The disease did not appear among any of the civil population at the village of Stanger; and as far as I was able to discover the horses and mules were exempt.

Incubation Period.—The disease was characterised clinically as follows: As far as it was possible to decide, the incubation period appeared to be from a few hours up to perhaps three or four days. The first cases occurred four days after the arrival of the column at Eshowe, so that it is probable the disease originated there.

Invasion.—The invasion appeared, except in a very few cases, to be ushered in by no very prominent symptoms. Only in a few cases was there any evidence of a rigor, nor was there any vomiting. Headache and a general feeling of malaise were most often noticed as prodromata. It was observed in some cases that the first symptoms complained of by the men reporting sick were in some, enlargement of the lymphatic glands, occurring in the groin, cervical, axillary or submaxillary region; in others a rash was first noticed, or again, severe headache with pain in the back and thighs.

Temperature.—All the cases were accompanied by mild fever,

the temperature never reaching a great height, but generally showing an evening rise, reaching its height about the second or third day, and declining about the fifth or sixth day of the disease. After an interval of from twenty-four hours to three days the fever returned, averaging a maximum of 100° F. A marked feature of the disease was the constant presence of enlarged and tender lymph glands. It is no exaggeration to say that it practically occurred in 99 per cent. of the cases.

Lymphatic System.—In some cases different groups of glands were affected in the same individual, for instance, the cervical, axillary and inguinal would be enlarged and tender in the same man. Other glands noticed to be enlarged were the femoral, sub-axillary, popliteal, epitrochlear, the glands on the border of the pectoralis major, and a small gland in front of the ear. The affected gland was found to be clearly defined from the surrounding tissues, extremely painful, and very tender to pressure. There was never any infiltration into the periglandular connective tissue, nor any tendency to suppuration nor necrosis of the gland substance. In cases where sores were present, the lymphatics between them and the neighbouring glands were inflamed. If the sore was below the femoral glands, then the lymphatics leading to them were affected, at the back of the neck or shoulders, the cervical, &c. From this it is probable that some of the cases of glandular enlargement were aggravated by the patient scratching the rash, which was intensely irritating, and thereby giving rise to septic infection, which is borne out by the number of staphylococci and streptococci observed in the sores. The men, from long trekking, were in a condition likely to produce rapid septic infection when debilitated by the disease, either by the rubbing of their flannel shirts, or by scratching with dirty nails.

In a large majority of the cases examined I was able to trace a sore in connection with the special set of glands involved. That the glands are inflamed to some extent by the disease is undoubted, because in some cases the first symptoms complained of were glandular swellings, which may occur in the first twenty-four hours; and again I have seen cases in which the groin was very tender, but no gland could be felt enlarged, yet in another twenty-four hours the glands were enlarged, no sores or rash being visible. During the secondary fever the glands again become enlarged, painful, and generally in the originally affected set. The pain and swelling in the gland persist after subsidence of the fever, and never subside before the seventh day of the disease.

Nervous Symptoms.—Headache at the beginning of the disease was very severe and persistent. It was generally referred to the back of the head and eyes, movement of the eyes being painful. Aching in the loins, down the back of the neck and in the thighs was a common experience. Frequently there was marked muscular pain, with tenderness in the muscles when pressed. Some patients complained chiefly of pain in the popliteal space, frequently attended by swelling of the popliteal glands. Aching and a boring pain in the bones, with stiffness of the joints, occurred in not a few cases. Giddiness was commonly observed, but occurred chiefly about the fifth day on decline of the fever, and persisted for varying periods. Insomnia was frequent, and a first indication of improvement was frequently that the patient had had a good night. Photophobia was only complained of in a few cases.

Diarrhœa. — About 30 per cent. of the cases had diarrhœa, occurring after the fourth day, characterised by very loose motions, dark in colour, and averaging four or five motions daily.

Eruption.—In all cases the eruption was a pronounced feature. In the early stages the skin was erythematous. On or about the fifth day, and generally on decline of the fever, a secondary eruption appeared, commencing on the wrists and forearms, extending also to the trunk. The forehead, back, face, chest, abdomen, thighs and ankles were chiefly affected, but in most cases it was more or less universal when fully out. The rash was present on the soft palate and fauces in those cases in which sore throat was complained of. The eruption consisted of discrete papules from $\frac{1}{8}$ inch to $\frac{1}{4}$ inch in diameter, with the apex containing a little serum. A slight roseolar area surrounded each, but the skin was not generally affected. In many instances the men were affected by dusky-red papules $\frac{1}{2}$ inch to 1 inch in diameter, the central area of which rapidly necrosed, forming a black scab, which when removed by scratching left an ulcer about $\frac{1}{8}$ inch in depth. These sores persisted for some time, and as previously stated, the lymphatics from them were often inflamed, with corresponding inflamed and tender glands. The rash was intensely irritating. A furfuraceous desquamation followed and was prolonged sometimes for a period of ten days. During a relapse there was a secondary outbreak of the rash, similar in character, but lasted for a shorter period.

Tongue.—The tongue was, as a rule, moist and fairly clean; in some cases it was coated with a creamy-white fur, leaving the tips and edges clean. A foul tongue was the exception, and in no case was it dry.

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Pharynx.—In a few cases the pharynx was red and congested, and the rash was visible on the soft palate when present on the body. With the sore throat the glands beneath the lower maxilla were enlarged and tender. The disease was generally marked by much depression and a feeling of great bodily weakness, which persisted for from six to fourteen days after the decline of the fever.

Secondary Fever.—A recrudescence after a few days' convalescence had been established occurred in the majority of the cases, characterised by a second appearance of the rash, the temperature again rising, with the glands again becoming tender and enlarged. It generally occurred within a week or ten days from the subsidence of the original fever.

Diagnosis.—This particular epidemic seems to be peculiar in the marked enlargement of the lymphatic glands in 99 per cent. of the cases, and the profuseness of the rash with the occurrence of ulcerating papules, but otherwise the symptoms point to those of epidemic dengue, which occurs in this country. It was highly infectious, spreading rapidly, and from the disease being confined to the camp, it appears probable that the infection is carried by personal contact or through clothes and other fomites.

Distribution.—It has generally been considered to be a disease of the coast lines, and occurs in Durban and along the Natal Coast, but in this instance the disease was evidently contracted inland. It occurs also in Northern Natal, and cases I have seen there were not invariably accompanied by glandular swelling or papular sores. The disease varies in type in different localities and during different epidemics. A high atmospheric temperature seems essential, but it does not seem to depend on telluric influence.

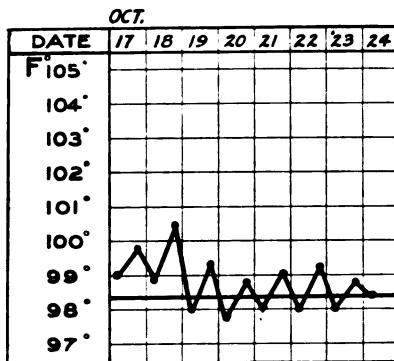
Pathology.—There having been no mortality, no opportunity was given to examine the internal organs. The blood was watery and showed an increase of leucocytes. No marked enlargement of the spleen was observed.

General Remarks.—The disease differs from influenza in that there is never any catarrh nor pulmonary complications. It spreads with great rapidity, and is capable of being spread from man to man by personal contact. From the fact that a desquamation in the form of fine scales takes place, it is probable that this is one of the channels of infection. There is no positive proof at which period of the disease the infection is greatest, but judging by analogy, it is probable that during the stage of desquamation it is most likely to be spread, and a greater care should be exercised in disinfection of the skin, with isolation of the patient, until this period is passed.

The epidemic was undoubtedly severe in its course, for although the fever was never high, the depression and weakness were great, and the glandular enlargement alone was sufficient to render a large number of men inefficient. Including the period of convalescence with possibility of a relapse, the course of the disease may be said to run from ten to twenty-one days. As a rule the disease is unattended by any secondary complications, health being fully restored. I append clinical notes of a few cases, with charts of their temperatures.

NOTES ON CASES.

CASE 1.—No. 3876 Private Idell, 7th Dragoon Guards, aged 25. Reported sick on October 23rd, at Stanger, complaining of headache and tender groins. He felt ill first on the 21st, when he had headache and pain at the back of the eyes, and felt feverish. He complained of pain behind the left knee, and the groin on the same side was painful and extremely tender to pressure. A gland appeared swollen twenty-four hours afterwards. On the outer aspect of the left leg were two small inflamed papules, with a central necrosed area. The secondary rash appeared three days later. He experienced great depression, with aching and boring in the bones. His temperature was 100·2° F. in the mouth.

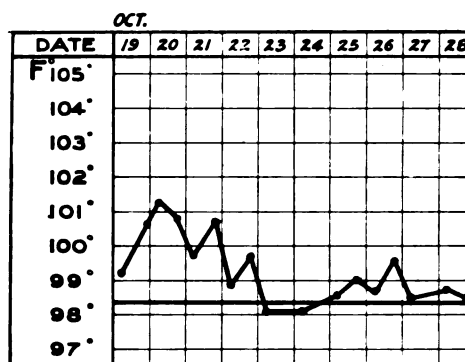


CASE 2.

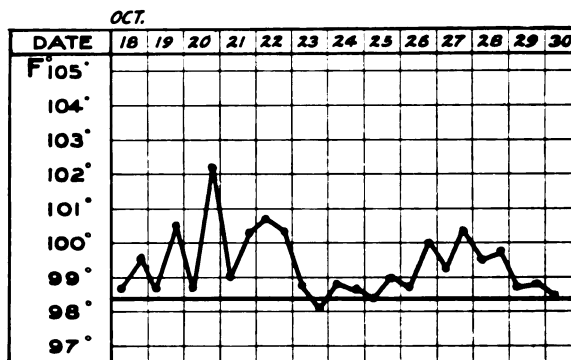
CASE 2.—Sergeant Penn, 7th Dragoon Guards. Had been ill for fourteen days at Eshowe, with glandular swellings in the left groin, which were painful and very tender to touch. Admitted to hospital on the 17th, when his temperature in the mouth was 99° F. His

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illness began with a bad headache and pains all over the body, across the back and down the thighs. He noticed the glands in the left groin were affected as stated. The right inguinal glands became swollen on the 18th. There was a sore on the inside of the left thigh, with inflamed lymphatics from it. Rash first appeared on the forearms and ankles, consisting of discrete papules, and



CASE 3.



CASE 4.

was very irritating. Tongue covered with a white fur, and red at the tips and edges. The glands of the posterior cervical chain became inflamed later in the disease. The blood was watery, with increase of leucocytes. Streptococci and diplococci were present in the serum from the papules. He suffered from great weakness and depression.

CASE 3.—Corporal Fox, 7th Dragoon Guards. Rash first appeared at Eshowe, but the glandular enlargement appeared later,

when coming down from Eshowe to Stanger. There were two sores, one on the left leg and the other on the inside of the lower third of the thigh. The glands of the left groin were large and painful. He ached all over, and the muscles of his thighs were sore on pressure. He had no diarrhoea. Serum from the sores on the twelfth day showed micrococci.

CASE 4.—Private Spary, Imperial Yeomanry. Was taken ill first at Eshowe, with pains in the head and back of neck and thighs. He ached all over. No sore throat. On the 20th he noticed the glands in both groins were enlarged and tender. He had two sores on the ankle (right) and a sore on the left groin. He then felt giddy, with great weakness and depression. The rash appeared over the arms, legs and body about the 20th. Temperature on admission 98·2° F., but rose to 102·2° F. on the 20th. In this case serum from the sores on the ankle showed the presence of the bacilli mentioned.

THE TREATMENT OF MALARIAL FEVER BY INJECTIONS OF QUININE.

BY CAPTAIN C. M. FLEURY.

Royal Army Medical Corps.

I THINK that all will agree that one of the most prevalent diseases in India is Malarial fever. Those who have served abroad must have been struck by the very large percentage of cases met with, so much so, that in many stations in India the loss becomes a very serious question when considering the efficiency of any unit. My attention was long ago drawn to this subject by the large numbers which were always to be found in the hospital, during certain seasons, suffering from malarial fever. It was also responsible for very many of the cases which came before the Invaliding Board, and it accounted for a very definite percentage of the deaths.

When cases came under treatment in hospital one could not help noticing the fact that numbers of them failed to react to quinine and arsenic when administered by the mouth. Men having every possible care and attention in hospital continued to get "fever" with the greatest regularity—even while undergoing treatment and having large doses of quinine administered daily. Many of these cases had features common to all. They were men who had served in the malarial climate for three or more years, who were apparently thoroughly saturated with Malaria, and in many cases there was enlargement of the liver and spleen. As the internal administration of drugs was apparently failing, I thought some other form of administration was indicated.

The question of simple hypodermic injection of one of the preparations of quinine was the first thing which occurred to one's mind, but on thinking the question out I came to the conclusion that if one could obtain a preparation of quinine which was readily soluble in water, and non-irritating, that then there would be a fair chance of giving the same without any great risk.

After making numerous enquiries I selected the quininæ hydrochloricum acidum of the B.P., finding that this preparation of quinine was readily soluble in distilled water *when warmed*, and that under these conditions 1 minim of distilled water would take up 1 grain of the acid quinine hydrochloride, while 1½ minims of the water would dissolve a grain quite readily.

The first difficulty was now overcome, in that a preparation of quinine had been obtained which was soluble in water, which could be given in small bulk, and which should not give rise to any irritation, and yet permit of a large dose of quinine being administered.

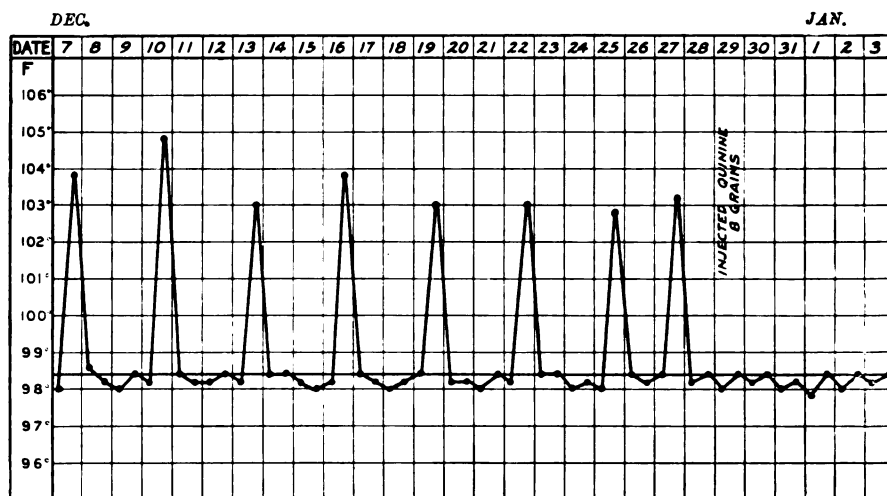
The next consideration was the site and depth of injection. The buttocks, thighs, legs and arm were to my mind unsuitable, and arguing on the assumption that the nearer to the spleen I could put the injection the better would probably be the result, I determined to give the injection with an ordinary hypodermic syringe, and to put it deep into the structures below the rib, just behind the middle axillary line on the left side, so placing the injection as near to the spleen as was consistent with safety. The procedure I now adopted was carried out in every subsequent case, and briefly it was as follows :—

The patient was always carefully washed over the proposed site of injection, and the parts rendered as aseptic as possible with carbolic lotion, or some similar antiseptic. The syringe was always most carefully sterilised, and generally I made use of a 10 minims syringe with a fairly long and fine needle. The solution to be injected was prepared at the time, or at any rate not more than three days beforehand; the strength of the solution being such that the syringe when filled with 10 minims contained 8 grains of the acid hydrochloride of quinine. The solution was always injected warm. Every precaution having now been taken, the needle was driven well home into the deep structure at the site already indicated, and the puncture wound so made was at once sealed with collodion and gauze on the needle being withdrawn. The amount of quinine generally injected was 8 grains, but in some of the more severe cases it was found necessary to repeat the injection in twenty-four hours, and in one or two cases I found it necessary to give 16 grains at one injection, and no bad effects followed. The results were in practically all cases most striking. I say in practically all, because it was found that where no reaction followed the injection the patient was suffering from some disease other than malarial fever. In one or two instances it was found that patients were suffering from hepatitis, and in one case certainly, where the diagnosis was not very clear, the patient failed to react, and was found to be suffering from enteric fever.

Details, with charts of some of the more interesting cases, now follow. The majority of the patients who were so treated were those who had been resident in India for some little time, who were

constantly getting "fever," and who had in nearly every instance some enlargement of the liver and spleen. *All* had been treated for some considerable time with quinine by the mouth, and in every single instance the treatment, although carried out in hospital, had proved ineffective.

CASE 1. — Gunner C., 47th Battery R.F.A., aged 20, contracted malarial fever in the Punjab. Had been getting fever off and on for months. Malarial cachexia was most marked. Liver and spleen both enlarged. Was a patient in hospital and taking large doses of quinine daily by the mouth when he came under my care. Purgatives were con-

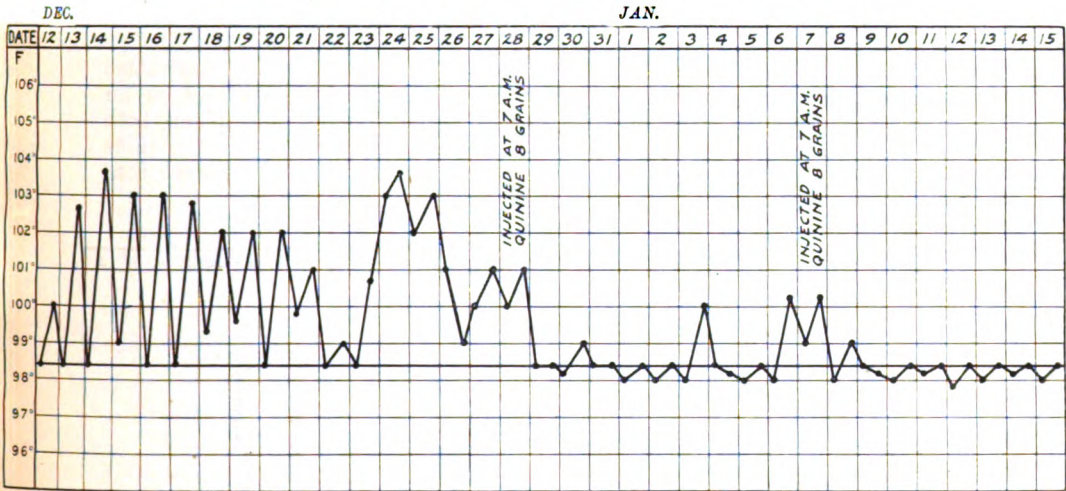


CASE 1.

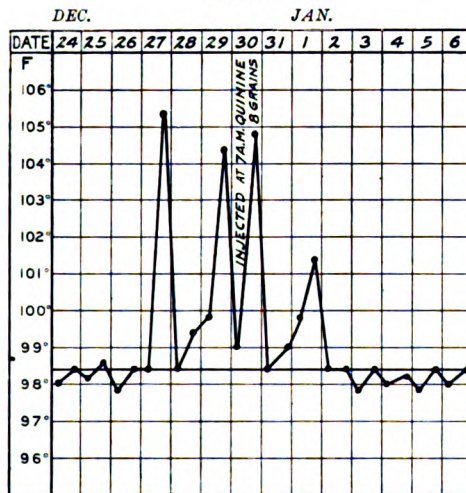
stantly being given, as the liver appeared to act very sluggishly, and for some time he was taking quinine in combination with magnesia. Patient was taking 20 grains per diem, and, as will be seen from the chart, in spite of treatment he was getting an attack with the most marked regularity every third day.

On December 29th I injected 8 grains of the solution already mentioned, choosing this day so as to immediately anticipate an attack. The injection was given in the manner already described. The result was most striking. I can well remember the anxiety with which I visited the hospital in the evening of the day when the attack should have come on, which it usually did about 4 p.m. The complete success which followed in this case I was hardly prepared for; somehow one thought that a return of the fever might be looked for, but nothing of the sort ever occurred. The patient remained under observation for a long time, doing his duty too, and so far as I could ascertain he never had another attack. I may add that in this case, as in all the others, as soon as the injection was given no further treatment by the mouth was carried out.

CASE 2.—Gunner T., R.F.A., aged 22. In India one year and ten months. Contracted malarial fever at Mian Mir. Malarial cachexia well marked. Liver and spleen enlarged. Had suffered from fever off and on for six months. As will be seen by the chart, the tem-

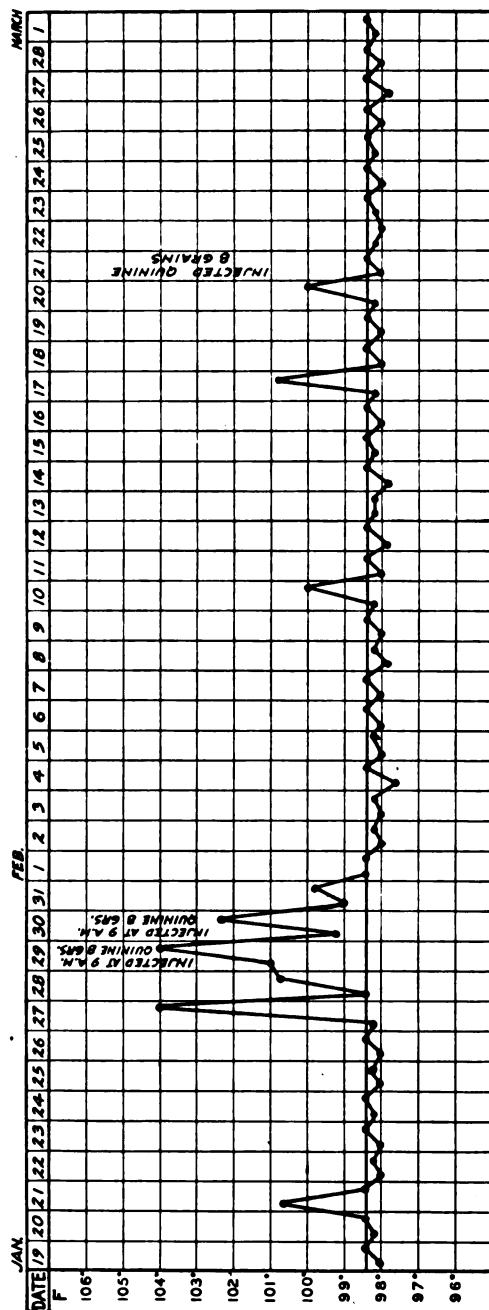


CASE 2.



CASE 3.

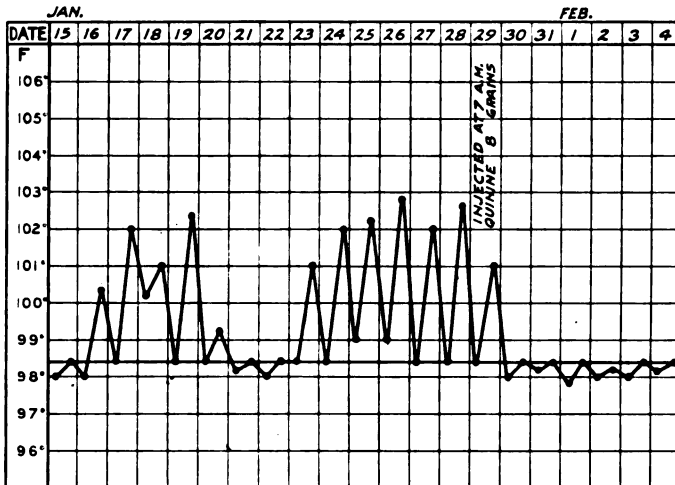
perature fell after eleven days' treatment, but immediately rose again. I at length obtained his consent to give an injection of quinine, and the temperature at once fell. Eight grains were given, the needle being driven well home into the deep structures over the spleen. A somewhat curious feature in his case was the what one might call abortive attack on



CASE 4.

January 3rd, followed by another three days later. I gave another injection of 8 grains, and patient remained then without any other attacks. The improvement which followed in this case was most marked. The cachexia cleared up and the enlargement of the liver and spleen disappeared.

CASE 3.—Private D., Oxfordshire Light Infantry, aged 23. In India four years. Contracted malarial fever when stationed in the Punjab, and had suffered with it practically all his Indian service: was sent down to the coast for change on the same account, where he came under my care. Apparently the attacks came on every three or four weeks, and that shown in the chart is fairly typical. I gave this man 8 grains by injection on January 30th, and beyond an abortive attack on February 1st, he never had another attack while under my care or observation. The spleen in this case was enlarged and tender. No further treatment in this, as in all the other cases, was ever given by the mouth after the injection.



CASE 5.

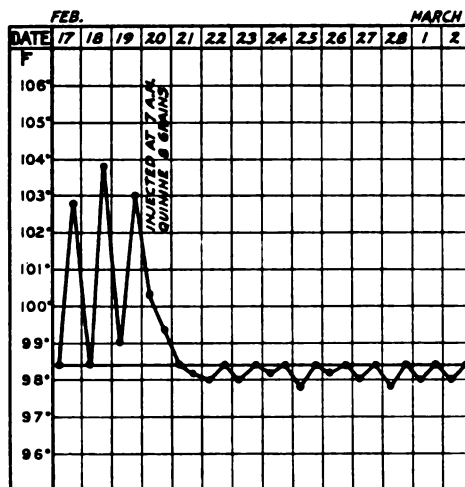
CASE 4.—Private C., 1st West Yorks, aged 24. Only one year in India, but four in the Straits and Hong Kong. This case was a somewhat curious one. Patient had a large spleen and very pronounced malarial cachexia. On January 21st he had a mild attack which subsided, but this was followed, a week later, by a very severe one. On January 29th I injected 8 grains of quinine, and followed it up next day by another of equal amount. Next evening the temperature rose a little, but remained normal for a time after that. On February 10th he had a mild attack, and again on the 17th and 20th. On the morning of the 21st I injected him for the third time, and no further attacks resulted; so that although he remained in the station for a long time afterwards, he never again came to hospital with malarial fever.

This was one of the few cases to whom I gave three injections. Some,

perhaps, will say the third was not necessary. The absolute cure which resulted must be my justification for giving it.

CASE 5.—Private B., Oxfordshire Light Infantry, aged 35. In India twelve years. This was the case of an old soldier. He had had very good health until he contracted malarial fever in the Punjab in the spring of 1900. The attack, as shown on the chart, was a very severe one, and although all kinds of remedies were tried no benefit resulted. This man had been suffering from fever all through December, with only a few days intermission between the attacks. The chart was unfortunately lost.

When he came under my care the liver and spleen were both enlarged, and malarial cachexia was most marked. I obtained his consent to inject quinine on January 29th, and the results in this case were everything



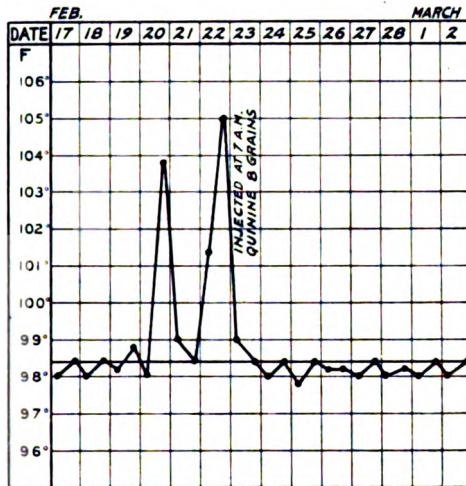
CASE 6.

that could be desired. The malarial cachexia cleared up, he rapidly put on flesh, and the enlargement of the liver and spleen subsided. At the end of two months he was in robust health. No further attacks followed during the two months he was under my observation.

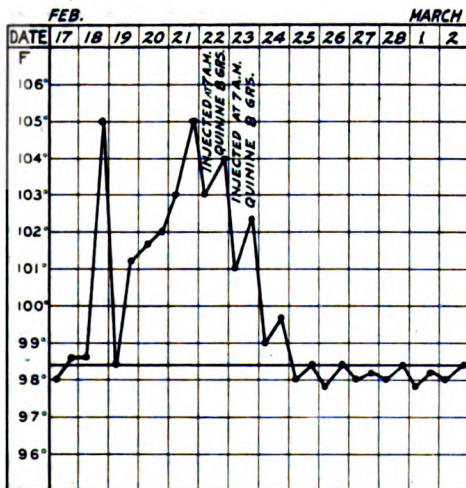
CASE 6.—Private B., Royal Inniskilling Fusiliers, aged 28. Five years in India. Contracted malarial fever in the Punjab. Patient had suffered with it for three years, and was continually getting attacks. He came under my care during one of these, and I injected 8 grains on February 20th. The temperature at once fell, and he had no further attacks while he remained in the station. This man was sent to the coast from the Punjab, as he was so ill. After the injection he rapidly improved and in a short time was quite well.

CASE 7.—Lance-Corporal T., 1st West Yorks, aged 26. Only one year in India, but five on foreign stations, including Hong Kong and the Straits. This was a very instructive case, as the N.C.O. complained he was tired of taking quinine, as it failed to ward off the attacks, and he

was constantly getting "fever." I gave him one injection and the temperature at once fell. Until the patient was given the injection he had been taking quinine three times a day by the mouth. He remained under my observation for nearly two years and had no return of malarial fever.



CASE 7.



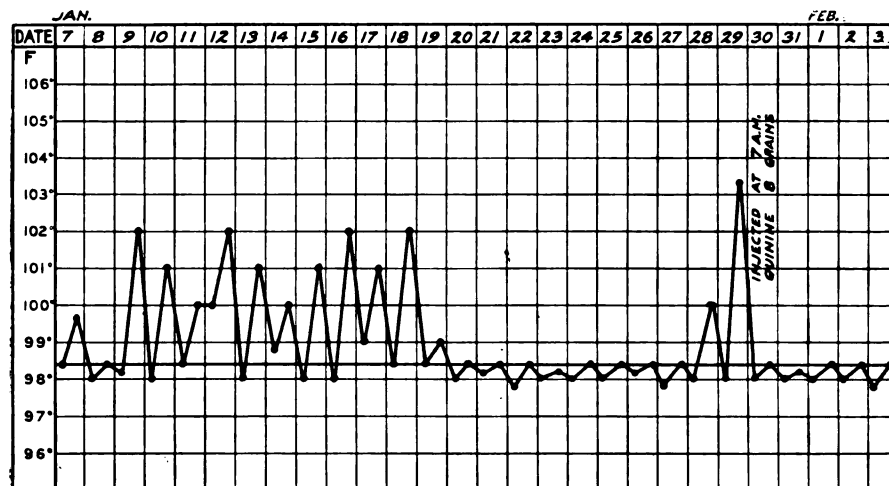
CASE 8.

CASE 8.—Private L., 1st West Yorks, aged 25. One year in India, five on foreign stations, including Hong Kong. Patient contracted malarial fever at Hong Kong, and this was followed by a long period when he was free from attacks. Finally the attacks became most constant. For

one of these he was admitted to hospital, and I gave him two injections of quinine, 8 grains each time. The fall in temperature in this case was not nearly so sudden as in some of the others.

When patient came to hospital he was anæmic and had some splenic enlargement. He remained in the station for a long time afterwards, became fit and well and, so far as I knew, had no return of the malarial fever.

CASE 9.—Lance-Corporal W., 1st West Yorks, aged 25. In India one year, on foreign stations, including Hong Kong, for one and a half years. This patient came to hospital in the middle of an attack and had very severe melæna, but refused to be injected. He recovered under treatment, and remained free for eight days. Then, however, he had another attack,



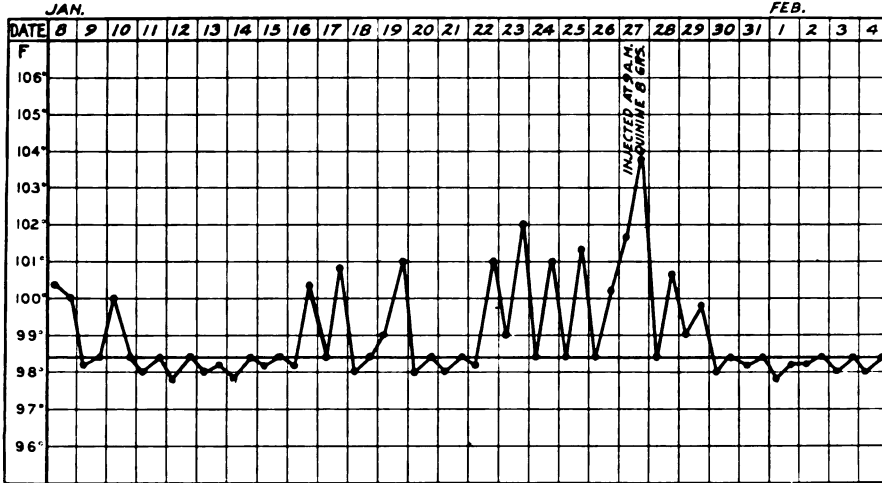
CASE 9.

and I obtained his consent to inject; he was given 8 grains only. The temperature at once fell and he had no further attacks, although he was under observation for a long time.

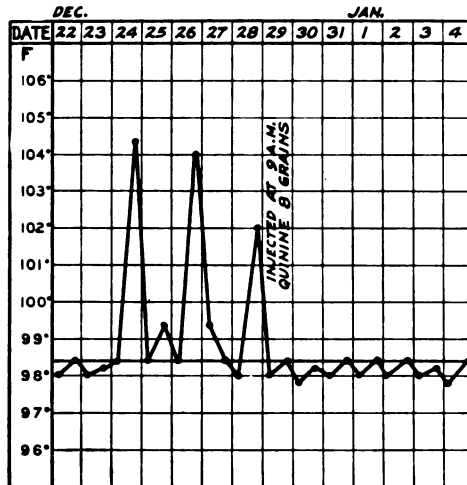
CASE 10.—Private P., 1st West Yorks, aged 25. On foreign service three years, but only about one year in India. This patient also came to hospital in the middle of an attack. He was kept in hospital, and while under treatment, taking quinine by the mouth, he still continued to get malarial fever. As can be seen from the chart, the type was somewhat irregular, the general tendency being a progression towards a more severe form with higher temperatures. This man when in the middle of an attack, when all treatment by the mouth was apparently inoperative, was given an injection of quinine, and the temperature at once began to fall. I had this patient under my own observation for a long time afterwards and he had no return of the malarial fever.

CASE 11.—Private D., Oxfordshire Light Infantry, aged 28. Seven and a half years in India. Contracted malarial fever in the Punjab,

where he became so ill and debilitated from constant attacks that he was sent down to the coast. These attacks appeared to come on once every month. After arrival on the coast he remained free for some time, taking quinine daily, then an attack came as shown on chart. I injected him



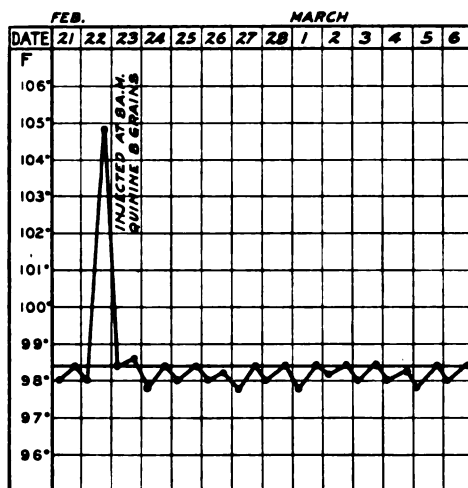
CASE 10.



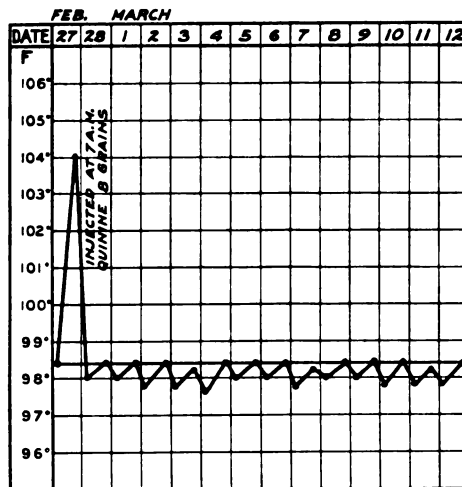
CASE 11.

and the temperature at once fell. This man's spleen was somewhat enlarged, but became much smaller within six weeks of the injection. He had no more attacks while under observation and his general health was much improved.

CASE 12.—Private S., 1st West Yorks, age 24. In India one year, and two and a half years in the Straits. An example of a single attack treated by this method of injection.



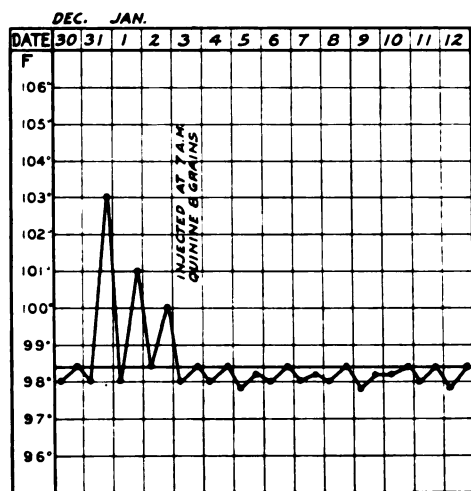
CASE 12.



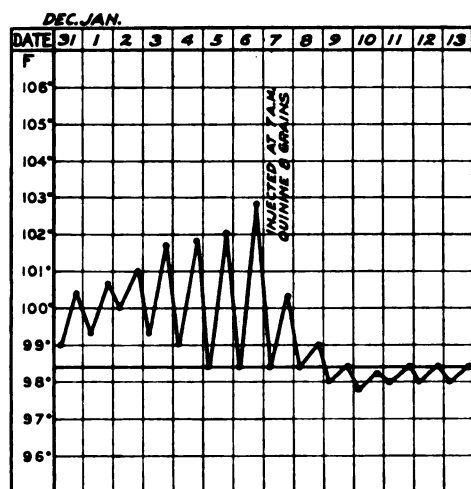
CASE 13.

CASE 13.—Driver W., R.F.A., age 21. In India three years. Had constant attacks of ague, but rarely reported sick as he was an "employed" man. Looked very ill and anæmic. Spleen enlarged. An excellent example of effect of one injection. Patient rapidly recovered and was free from fever for a long time afterwards.

CASE 14.—Driver J., R.F.A., aged 23. In India three years. Contracted malarial fever in the Punjab, was constantly getting attacks, though taking quinine by the mouth. Given one injection and improvement most marked. No return of fever, though patient kept under observation for a long period.



CASE 14.

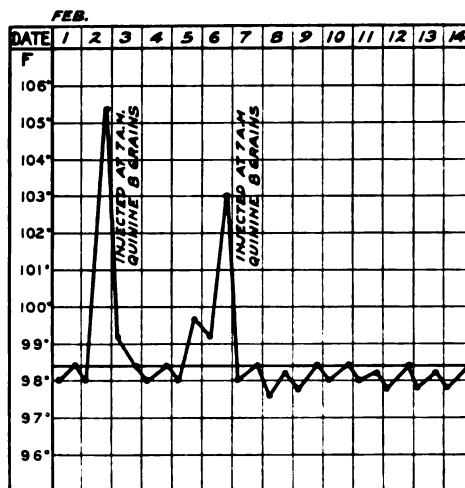


CASE 15.

CASE 15.—Private S., 1st West Yorks, aged 25. One year in India, two and a half years in Straits. This man was another of those cases which were constantly being laid up with fever. The liver and spleen were

both enlarged. Malarial cachexia marked. Patient consented to have an injection of quinine and he then rapidly improved. No recurrence, though patient was kept under observation for a long period.

CASE 16.—Private W., Oxfordshire Light Infantry, aged 23. Three years in India. Contracted "fever" in the Punjab. Looked very ill when he arrived at the coast for change. Liver and spleen both enlarged. This patient, as can be seen from the chart, required two injections. It was a very striking example of the benefit of the injection treatment. He rapidly improved and had no further attacks. The enlargement of the liver and spleen quickly subsided.



CASE 16.

CASE 17.—Lieutenant H., 1st West Yorks, aged 22. One year in India. This young officer was always being laid up with malarial fever, and treatment by the mouth appeared to have no effect on him. I gave him two injections of quinine, a week being allowed to elapse between each, and 8 grains were given each time. The fever at once ceased. Within a week of the second injection he joined a big shooting camp, and stood day after day, for about six days, up to his middle in water shooting duck. He had to ride back to camp on a camel each evening a distance varying between eight and twelve miles, and this he did in his wet clothes. No attack of fever followed and he remained free for a long time afterwards. I may add that as soon as the first injection was given all treatment by the mouth ceased. Chart unfortunately lost.

CASE 18.—A civilian, Mr. C., Public Works Department, came to me as he heard I was injecting quinine, and all treatment of his malarial fever by the mouth was a failure. Was constantly being laid up with fever, and so surely as he remained out at his work till 10 or 11 a.m., so surely did he get an attack. I gave him two injections, 8 grains in each, and allowed a week to elapse between the two. He had no more attacks. Became

much improved in health and was able to undergo any amount of fatigue and exposure. No chart available for this case.

I could go on enumerating numberless cases, but I have confined myself to the most typical and interesting ones. I do not claim that this particular method of treatment is in any way new, for indeed Manson mentions it in his book on tropical diseases. What I do claim for it is this: that we have at hand an easy and rapid method of cure. No inconvenience is caused to the patient, no headache, no buzzing in the ears ever ensues, and in that type of fever where all ordinary remedies fail one has the means of cutting short the disease in a comparatively rapid manner.

So far as my results were concerned, I may say they exceeded any possible expectation, and I trust that should others try this method that they will meet with a like success.

In conclusion, I would desire to point out that cases occur from time to time where a doubt perhaps arises as to whether the patient has been taking quinine. If you give the injection you are certain on that score. The cases I have quoted were all men in hospital, to whom the medicines ordered were given by a responsible warrant officer, and I had no reason to doubt the fact of their taking the drugs ordered.

Finally, I can only hope that those N.C.O.'s and men who were willing to submit to the injections, and so set an example to perhaps their more sceptical comrades, derived permanent benefit, a benefit which I hope and trust may have continued through all the conditions of service which may have befallen them since.

ENLARGEMENT OF THE SPLEEN IN LOWER BENGAL.

BY LIEUTENANT J. MCKENZIE.

Royal Army Medical Corps.

To one who is new to India there is, perhaps, nothing so puzzling as the condition of splenic enlargement.

Until Leishman's epoch-making discovery, enlargement of the spleen was thought to be due to malaria and to that alone. I speak from personal knowledge of Lower Bengal only, but in that region at least a short experience suffices to raise grave doubts on this point, and the more one sees of malaria and splenic enlargement, the less one feels inclined to associate the two as a matter of course in every case. Out of a mass of cases (chiefly natives) with high fevers and low fevers, large spleens and small spleens, temperatures without spleens and spleens without temperatures, it becomes possible to extricate two important classes:—

- (a) Those who have had several attacks of typical malaria, with definite rigor, high temperature and the malarial parasite in the blood, but who have very little or no enlargement of the spleen.
- (b) Those who have had a few mild attacks of "fever," but have been "seedy" for some time and are found to have very great enlargement of the spleen.

In (a) the malarial parasite is found without difficulty, especially if search is made during a period of fever. In (b) the malarial parasite can rarely be found, and continual search may be made without discovering any parasite in the peripheral blood. But if the spleen be sufficiently large to allow of a splenic puncture being made during a period of fever (usually of a low type, and often showing a double rise in the twenty-four hours), Leishman bodies are found in a large proportion of the cases. It has been demonstrated that this same organism is found in kala-azar, and the high mortality of kala-azar shows that in places where that disease abounds the parasite is present in much greater numbers or in a more virulent form—suggesting the comparison of plague and pestis minor.

Talking of Calcutta district in particular, the more one sees of splenic enlargement, the more does the malarial parasite retire to the background, and the stronger becomes the conviction that it has been a much maligned organism in the past, and has got the credit, or discredit, of a great deal more mischief than it was really responsible for.

With regard to the organism described by Leishman, the problem

at present facing us is a three-fold one : (1) What is the nature and classification of the parasite? (2) What is its source in Nature? (3) By what means does it gain entrance to the human body?

(1) *With regard to its Nature.*—It has been differently described as a trypanosome and as a piroplasma, and as being neither of these but a new parasite altogether. Some observers thought that they had seen it inside red corpuscles; others maintain that it is never found inside the red blood cells. From study of the parasite and the mass of evidence, it seems pretty certain that the parasite is carried free in the blood plasma, that it is never found inside the red cells, and that it is not a piroplasma. Arguing from analogy, it would seem that the forms seen up to the present are asexual phases in the history of a yet unknown parasite.

(2) *With regard to its Source in Nature.*—The malarial index in Calcutta is practically *nil*, and it is true that the percentage of children with enlarged spleen is also very small. But in the country immediately surrounding Calcutta it is found that although the malarial index is still very low, rarely above 10, the percentage of children who have enlarged spleens is enormous. This fact of itself would seem to suggest the separation of malaria and splenic enlargement. On examining a large number of native children in Dum-Dum, I found the percentage of enlarged spleens to be 76. In many of the cases examined the spleens were of enormous size, extending down to the pelvis; and though nearly all gave a history of fever of a low type, yet none of these cases gave a history of typical malarial attacks, and in none of them was the malarial parasite found. But in one group of twenty-three children, belonging to the native followers employed at the Station Hospital, the fact was noted that only seven had enlarged spleens, and that in most of these enlargement was slight, the spleen extending only one or two inches below the costal margin. This gave a percentage of 30 with slight enlargement as against the 76 per cent. with great enlargement in former observations.

On comparing the conditions of life of these followers' children (*x*) with those of the children coming from the surrounding villages (*y*), the only difference discoverable lay in the fact that group (*x*), living in Government quarters on the Jessore Road, and at some distance from any tanks (though close to mosquito-breeding marshes), made use of the Cantonment water supply for cooking and drinking purposes, while group (*y*) made use of tank water for these purposes. This Cantonment water supply, like that of Calcutta, is drawn from the river Hoogli, above Barrackpore, passed

through filter beds and brought down in pipes. Standpipes are placed at intervals along the roads in the Cantonment and from these the *bhisties* fill their "mushuks" and distribute the water.

Having noted this difference in the source of the drinking water, in future examinations the children using tank water were put on one side and those using Cantonment water on the other. It now at once became apparent that the tank water group (*y*) claimed nearly all the cases of enlarged spleen, leaving in the Cantonment water group (*x*) a small number of only slightly enlarged spleens.

It is impossible to draw a hard and fast line between the two groups, as families may have moved from one place to another, and children who have been drinking tank water until a few months ago may be included in the Cantonment water group; again, children who ordinarily use Cantonment water may at odd times drink from any inviting tank. It is also noticed that among native children living within the Cantonment, or on its borders, and regularly using the Cantonment water, cases of enlarged spleen are not nearly so numerous, and these children are much healthier than those in the villages around. It seems reasonable, then, to connect this condition of low fever and enlargement of the spleen with the drinking of tank water, and to suppose that the organism which is its cause lives and flourishes in the tanks.

(3) *The Mode of Entrance into the Human Body.*—At the first blush one sees in the tanks of India only a merciful provision for one of the most urgent necessities of life, and doubtless without a substitute it would be in many places all but impossible to do without them; but when one looks more closely into the matter and reflects on the uses to which a tank is put by the natives, it ceases any longer to present itself as a pool of limpid water for the refreshment of man, but appears rather as a masquerading cesspool, hiding beneath the water lilies that grace its surface death-dealing germs of every kind. Let us watch by a tank when the day is young. Not singly, but in dozens or scores, the manhood of India descends into the tank, stirs up the mud at the bottom, relieves Nature in any way that seems good to him, washes without soap his oily, odoriferous skin, and at the same time his loin cloth, makes an effort to cleanse his teeth—using a forefinger by way of tooth-brush, and tank water in default of Odol—quenches his thirst by gulping down a few handfuls, and being thus refreshed carries off his "surahi" full of water with which to cook his food. In the evening the females have their turn, and the proceedings of the morning are repeated. And this polluting process goes on incessantly, day after day, year after year, generation after generation.

If we now consider the distribution of the parasite in the body, we find that its presence has been demonstrated in ulcers of the intestinal wall, in the mesenteric glands, in the portal vein, in the liver, in the spleen, and in the bone-marrow. A reasonable view to take is that the parasite gains entrance through the wall of the intestine (where it causes ulceration), reaches the liver by the portal vein, and the mesenteric glands by the lymphatics. That it now reaches the general circulation is proved by its presence in the spleen and bone-marrow, and if it were intracorpuseular it could scarcely fail to be found at some time or other in the peripheral blood. We might compare it with the case of carmine particles or bacilli injected into the circulation and suppose that it is now attacked in the spleen and bone-marrow by the leucocytes, which seem to find there a suitable battle-ground.

The fact that it has been found in sores of the skin and not in the internal organs in the same cases seems to be in favour of the theory of its entry by the alimentary canal. If its usual mode of entry were injection into the blood by a biting insect, one would not expect to find it in an ulcer of the skin, or having found it there would hope to find it in the internal organs as well.

SUMMARY.

(1) In Lower Bengal malaria is comparatively rare in places where splenic enlargement is all but universal.

(2) Natives who drink filtered river water do not suffer to any great extent from enlargement of the spleen, while those who drink tank water suffer to the extent of about 80 per cent.

(3) In cases of splenic enlargement examined during a pyrexial period the Leishman body is found.

(4) Of the organs in which the parasite is found most are associated with the digestive system, while the remaining ones are those in which the leucocytes are known to wage war on organisms and foreign particles that are circulating free in the blood plasma.

CONCLUSIONS.

(1) That the low fever and enlarged spleen of Lower Bengal is caused by the Leishman body.

(2) That this organism flourishes in the tanks.

(3) That it gains entrance to the human body through the alimentary canal.

NOTE.—Since the above was written, Captain Leonard Rogers, I.M.S., has announced that Leishman bodies, cultivated under certain conditions, yield trypanosomes.

CURIOUS HABIT OF THE AFRICAN COBRA
(*NAGA HAJE*).

BY LIEUTENANT-COLONEL C. R. BARTLETT.
Royal Army Medical Corps.

SOME weeks ago, Captain Perry, R.A.M.C., told me that on going into an outhouse at Wilberforce he disturbed a black snake, which reared up and spat at him, the fluid ejected entering his right eye. He had to lie up for the rest of the day, the conjunctiva being inflamed and painful, and the lids œdematous.

Yesterday the same thing happened to me. I was sitting in the Mess, when Captain Blossie, C.S.O., said he saw a snake on the lawn below. He went down with a stick and struck the reptile as it was gliding away. It moved off slowly with head erect and hood expanded, and took refuge under a flag-stone which forms a foot-way over a drain. We sent for a bucket of boiling water to dislodge it, but before the water arrived the snake emerged and I struck it two or three times over the head and neck. Immediately afterwards I felt a severe pain in my left eye, which received the charge. The right eye became affected a minute or so afterwards. I put my face in a basin containing a solution of bicarbonate of soda and opened the eyes when under water, and so dislodged some of the poison. The conjunctiva became very congested and the lids œdematous. The pain and photophobia lasted about nine hours. It was much relieved by hot fomentations. The snake was 4 feet 6 inches in length. The dorsal surface was black and the ventral of a slate colour. On the ventral surface, starting below the hood, were eight strips of an orange colour. There is a snake in South Africa, the *Sepedon hæmachates*, which is called by the Boers "spuw slang," or spitting snake, from its habit of ejaculating the contents of its poison gland when irritated. This snake, however, is only 3 feet long, whereas the one I killed was 4 feet 6 inches, and the one Captain Perry saw was 6 feet, so I conclude that *Naga haje* must possess the same power of expelling its venom as *Sepedon hæmachates*.

I have lived sixteen years in India, and have killed many cobras, but I have never witnessed or heard of a similar occurrence in that country.

RAPID AMBULANCE FOR MOUNTED TROOPS.

BY SERGEANT W. MERCHANT.

Royal Army Medical Corps.

SURGEON-GENERAL W. L. GUBBINS, M.V.O., writing from his experiences in South Africa in the April number of the JOURNAL OF THE ROYAL ARMY MEDICAL CORPS, had an able article on "Field Medical Organisation," and in the course of his remarks the General expressed the hope that others would offer their opinions upon the subject.

With Surgeon-General Gubbins' expressed wish as my only apology, I may probably be permitted to attempt to give some opinions I have arrived at; and in so doing I may say it is my intention to confine myself entirely to a consideration of the requirements of mounted troops. It is with these Surgeon-General Gubbins is dealing when he urges the necessity for a "field ambulance," which Murray's "Standard Dictionary," he says, defines as "a moving hospital which follows an army in its movements, so as to afford the speediest possible succour to the wounded." The General also emphasises with particular stress "the necessity of not losing sight of the *mobility* of a field ambulance, which is the essence of its utility," and the necessity for "above all, ambulance waggons specially adapted for the needs of Cavalry, Royal Horse Artillery and Mounted Infantry."

Taking for granted, therefore, what undoubtedly is the fact, that the present ambulance arrangements and equipments for mounted troops leave much to be desired, I am of opinion, after considerable practical experience, that there has been found an ambulance which meets the recognised requirements—I speak of the "Rapid Transit Ambulance."

It was in the JOURNAL OF THE ROYAL ARMY MEDICAL CORPS for January, 1904, that Surgeon-Lieutenant Avery wrote an article dealing with what he terms his "new galloping ambulance." Since that time some slight modifications and improvements have been made. As he then said, this ambulance has been on duty with the Suffolk, Sussex, and Middlesex Imperial Yeomanry during their respective trainings, and also with the Wiltshire Yeomanry during their then recent manœuvres. Since that date the Suffolk Imperial Yeomanry have undergone their 1904 training at Bury St. Edmunds, and it

was then that I had the pleasure, by Lieutenant Avery's permission, to inspect his invention at work on several occasions.

The "Rapid Transit Ambulance" is especially constructed to accompany mounted troops in time of war and in manœuvres over all sorts and conditions of ground, where it would be absolutely impossible for the stretcher-bearers on the ordinary ambulance waggon to keep in touch with the medical officers attached. As is well known, it very frequently happens, either in actual warfare or in manœuvres, that a stretcher is urgently required at a distance from where the ambulance waggon or bearers are stationed, and much delay is caused by waiting for their arrival. Now delays are proverbially dangerous, but when valuable time is thus lost in conveying the unfortunate wounded to hospital or to the nearest rest camp where they can be carefully and skilfully treated, the results are oftentimes most disastrous. Even when stretcher-bearers are within fairly easy distance and their arrival prompt, that mode of conveyance, besides being slow, is not the most comfortable conceivable, and the unavoidable swaying motion is by no means beneficial to the patient. Again, should the country be of such a nature that it will not permit the ordinary ambulance waggon to proceed, a continual change of stretcher bearers is necessitated, and valuable time thus lost. If the cases are conveyed on the ambulance waggon as now used there is ever present a distinctly unpleasant jolting sensation, even over comparatively smooth ground, and in most cases this is decidedly detrimental.

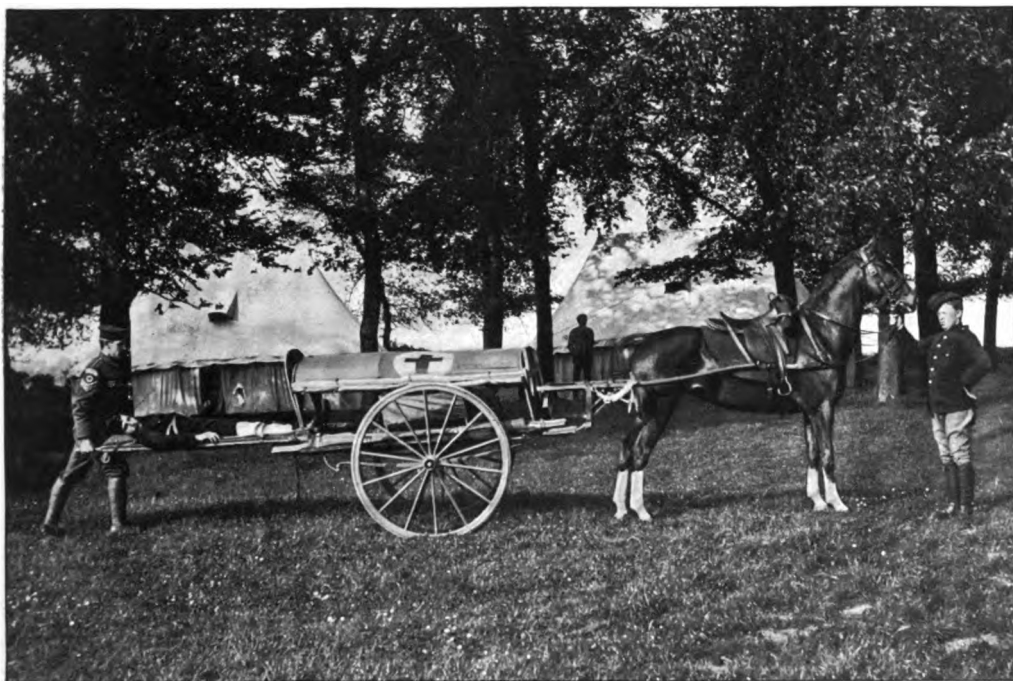
It really appears to me that all these deficiencies or faults are supplied or remedied by the "Rapid Transit Ambulance." In the first place, so delicate are the springs and so deftly are they arranged, that even over the most broken country there is positively no perceptible motion to disturb the patient. This I know by experiment, for, acting as an invalid, I was driven over rough and rugged ground, not only at an easy pace, but at full gallop, and had I had a broken leg or any other such injury, there was no motion which could in any way have inconvenienced me.

Then the fact that this ambulance can travel at a speed of sixteen miles an hour at once disposes of the serious question—loss of time—that most determined drawback to both the ordinary stretcher-bearer and the present ambulance cart. Another important point in connection with the "Avery Car" is that strength and safety have not been sacrificed in the attempt to produce something light and rapid.

Probably what is more important for field service, where few



LOADING.—1.



LOADING.—2.

To illustrate article "Rapid Ambulance for Mounted Troops," by Sergeant W. MERCHANT, R.A.M.C.



men can be spared, is that this ambulance can be manipulated with ease by one man, although I do not recommend it to be so utilised unless attended by three, or at the least two, men, because even those engaged in ambulance work are constantly exposed to danger from the enemy's fire.

In his article Lieutenant Avery described the general build and equipment of his invention, but it may not be out of place to state here that besides the stretcher that comprises part of the car, two further stretchers can be carried, for the use, if necessary, of ordinary stretcher-bearers, thus obviating much delay. Beyond the usual equipment carried on the cart itself, a pair of saddle-bags could be taken before the orderly who rides the horse attached, while the medical companion, surgical haversack, and water-bottle could be conveniently fixed to the front of the cart, items which should be taken into consideration, because they would enable the medical officer to treat numerous minor cases instead of sending them to fill up the field hospitals.

In an article so brief as this must necessarily be, it is impossible to enter as fully as one otherwise might into the working of Surgeon-Lieutenant Avery's car, but as I said at the outset, I firmly believe it would meet every requirement for service with mounted troops. In every true sense and application of the term it appears to embrace all those qualities which produce that mobility which, in the opinion of Surgeon-General Gubbins, is so necessary in any field ambulance. In conclusion, I may say it is my belief, after a practical and thorough trial, that this ambulance is in almost every conceivable way an improvement upon anything which is at present in use.

A VISIT TO LEYSIN, SWITZERLAND.

BY LIEUTENANT-COLONEL H. R. WHITEHEAD.

Royal Army Medical Corps.

WHILE on leave in Switzerland recently, I took the opportunity of visiting Leysin, where the special treatment of pulmonary tuberculosis is undertaken. My impressions may possibly interest my brother officers. Leysin, which for some time has boasted a local reputation for the treatment of consumption, was one of the first places where the high-altitude and open-air cure for pulmonary tubercular disease was systematically carried out, and it has very special advantages of its own. It is situated in the Vaudois Alps on a plateau, which is 4,785 feet high, is well protected on the north by the Tours d'Ai chain of hills, and has a southerly aspect. Not being overshadowed by high mountains, it has a large amount of sunshine. The slopes of the hills behind are covered by pine forests. The surrounding scenery is very fine, the Dent du Midi, and further off Mont Blanc, are well seen in their imposing grandeur. Leysin is easily reached from Aigle, which is on the main line which runs through the Rhone Valley. From Aigle an electric cog-wheel railway runs up the side of a valley and ascends to the plateau on which Leysin is situated. Leaving London at 10 o'clock in the morning, the traveller can reach Leysin by 12 o'clock the next day by a comparatively easy and cheap journey, the most troublesome part of which, probably, is driving from the Gare du Nord in Paris to the Gare de Lyon; or if the traveller does not wish to do this, he can get from one station to the other by going round Paris by the Ceinture Railway. As this takes some time I should not recommend it, as by driving across one has time to dine comfortably at the Gare de Lyon, and secure good seats by the 8.50 express, a through carriage on which goes to Lausanne, where the passenger changes into the train for Aigle. In the case of invalids, a sleeping berth should be taken from Paris to Lausanne; the latter place is reached about 8 a.m.

The electric cog-wheel train for Leysin starts just outside the station at Aigle, and takes an hour to reach its destination. The train ascends very slowly, as the distance from Aigle to Leysin by the hill-paths is only about eight miles, though considerably more by the railway. The railway to Leysin is a fine example of Swiss engineering skill. The line winds up the side of the valley, passing

first through vineyards, then through pine forests and woods, and by numerous tunnels, and bridges over ravines, it ascends gradually to the plateau above. The scenery on the way up is very fine, and the railway most interesting. The first impression of Leysin as you come upon it covered with thick snow, bathed in bright sunshine, and with a perfect blue and cloudless sky, is that it is a most beautiful spot. The perfect stillness almost depresses you, and this feeling is intensified when you think that this peaceful and beautiful spot is almost entirely given up to the treatment of a terrible disease, and consider all the sadness and grief which is so intimately bound up in its surroundings. The little village of Leysin lies peacefully below the terraces on which are built the sanatoria, pensions and villas, which are erected for the patients undergoing treatment for pulmonary tuberculosis. There are three big sanatoria instituted by "The Climatic Society of Leysin," where paying patients are received. There are also chalets in connection with the above Society, where families who do not wish to lead a hotel life may reside; besides these there are many pensions, and apartments in villas and chalets, also a popular sanatorium, and a small sanatorium for children; the latter two establishments are owned by a benevolent society, to these patients of a poorer class are admitted for a small charge. The three large sanatoria, called respectively The Sanatorium Grand Hotel, The Sanatorium of Mont Blanc, and The Sanatorium of Chamossaire, are situated on terraces, each with a promenade open to the south, and are about 600 feet above the village of Leysin. They are imposing looking buildings, fitted with every comfort and luxury. A resident medical officer is in charge of each, and he has one or two assistants. By the courtesy of Dr. Exchaquet, the medical superintendent, I was enabled to inspect the Sanatorium Grand Hotel. This is in reality a first-class hotel, with the essential difference that all the residents are under the direct control of a medical man, who in the case of patients goes into each individual case, and orders appropriate medical treatment, diet, exercise, &c. It is understood here that the finest climate in the world can only give the best results if the patients are subjected to a thoroughly hygienic method of life. There are two important factors concerned in the treatment of pulmonary tuberculosis. First, to remove the patients from any unhealthy surroundings, such as a populous city or other unhealthy region which they inhabit, and place them in a favourable climate, in a sheltered place, where they may breathe the purest air. Secondly, to provide a healthy and regular mode of

life in a house managed by a medical man who superintends the patients' manner of living, their residence in the open air, food, exercise, and occupations.

The climate of the Alps is especially suited for the open-air treatment. The air is of great purity and free from dust and contamination. It is very dry, and the absence of wind enables a low atmospheric temperature to be easily borne without discomfort. The coldness of the air acts as a stimulant and is most invigorating. The large amount of sunshine in these regions has also a most beneficial effect. Fog and mist rarely occur during the winter, especially at this height. Snow falls at intervals, and the weather preceding this is as a rule dull and cheerless. The cases of pulmonary tuberculosis which do best are those in the early stages. Dr. Exchaquet informed me that he considers 50 per cent. of such cases entirely recover when subjected to the climatic treatment. The cases that are unsuitable are those of advanced disease, with constant fever, and cases in which the heart is dilated and weak, without compensating hypertrophy. Some patients also have a special idiosyncrasy and cannot sleep in the higher altitudes, and are therefore obliged to descend to the plains on this account. The climate of Leysin is said to be suitable for tubercular patients during the whole year. Winter, with its fine, cold, bracing climate is probably the best time, but in summer the air is cool and pleasant, and the pine trees provide grateful shade. The best results are obtained then in those who go early in the disease and who remain sufficiently long to avoid the risk of a relapse. This is especially the case in those who have wintered there, and who should not expose themselves to the chance of a relapse by returning to the cold winds in the spring.

All the visitors in the sanatorium are not invalids, as many of the patients are accompanied by their relatives who are in good health. Dr. Exchaquet considers there is not much risk of infection at the sanatorium, and that the attendants did not suffer in this way. Great precautions are taken to prevent sources of infection, and the patients are on no account allowed to spit about the hotel or grounds, but are provided with a portable pocket spittoon, which is carefully cleansed and disinfected. If any patient is observed spitting about the place the fact is very quickly brought to the notice of the medical superintendent by the other patients, who realise the full danger of such a proceeding. The expectoration is boiled in a solution of soda. Dr. Exchaquet contends that infection is less likely to occur in a properly managed sanatorium,

where all precautions are taken, than in many of the hotels where possibly tubercular patients are residing and no special precautions taken. I could not find out that there was any undue increase of tuberculosis among the villagers of Leysin or among the cows.

Dr. Exchaquet very kindly personally conducted me round the sanatorium, which was extremely well heated by hot-air radiators, and kept at an even temperature. It was well ventilated and scrupulously clean. Like all hotels in Switzerland, it is lighted by electricity, and the sanitary arrangements were quite up to date in every way. One of the chief features of these sanatoria are the open-air galleries where the patients lie, for some hours every day, on long easy chairs. They are well wrapped up in rugs and fur sacks, and have hot-water bottles in addition. As the temperature in winter is usually considerably below freezing, and the whole place covered with snow, it is most important to maintain the body heat by these means. The patients do not sleep outside in these galleries, but in their rooms with the door and windows wide open; this is considered quite sufficient. The sleeping rooms are good-sized, comfortable rooms. I was rather surprised to find that they were carpeted and had curtains, but the medical officer informed me that he did not consider these likely to carry infection, in view of the precautions observed.

The patients recline in the open-air galleries several hours a day, according to their medical directions; if able they attend the dining room for meals, but have milk given them to drink between meals if it is thought advisable. Those who are in fair health and recovering are encouraged to take exercise. There is no lack of out-of-door amusements; a good skating rink is prepared just by the Grand Hotel; tobogganning, bob-sleighing and skiing are also much patronised by those who can enjoy them.

The medical staff consisted at the time of my visit of the Superintendent, Dr. Exchaquet, and two assistants. The patients are seen regularly, and careful notes and observations of their condition recorded. The sputa is examined regularly in a well-fitted little bacteriological laboratory, A room is also fitted up for the treatment of tubercular throat affections, and supplied with good electric lamps and other appliances. The prices of the three establishments differ, the Grand Hotel Sanatorium being the most expensive, and the Sanatorium Chamossaire the least so. The prices vary in the three establishments from eight to twenty-three francs a day, according to the size and situation of the room. The prices include board, lodging, heating, light, and attendance, also medical treatment. There are very few extras.

Not many English go to Leysin ; most of the English tubercular patients go to Davos, I believe. Most nationalities, however, seem represented.

I think the higher Alpine climates hold out very great inducements in the way of treatment. The still, cold air, bright sun and fresh surroundings are factors which materially help the cure. Patients soon appear to grow used to practically living in the open air. The open-air treatment, it appears to me, can be carried out with the greatest advantage in this climate, at any rate during the winter months. The perfect stillness and dryness of the air are conditions which can hardly be obtained anywhere nearer England than Switzerland. I found that not much reliance was placed on any drug treatment, these only being used as symptoms demanded, and not as a routine part of the treatment. The higher altitudes of the Alps are not only beneficial in pulmonary tuberculosis, but are especially so in anæmia, debility and over-work, although I do not think that people suffering from the latter complaints should go to a sanatorium devoted to the treatment of tubercle.

THE SOUTHERN SOUDAN—ITS CLIMATES AND DISEASES.

BY CAPTAIN W. BRAY.

Royal Army Medical Corps.

As there is now a British regiment always stationed at Khartoum, and it is possible, though not probable, it may suddenly be called on for duty, either garrison or active service (most probably patrol duty), in the Southern Soudan, I propose to give a short account of the Southern Soudan from an Army Surgeon's point of view. I neglect the Northern Soudan, as British troops have already operated there.

The information given in this report, necessarily short and broken compared with the vastness of the subject, has been obtained from my personal knowledge in parts, from information obtained by consulting reports and sick returns of the Egyptian Army, and from opinions obtained from other officers, mostly Captain Stallard as regards Kordofan, and Captain Cummins for Kassala and Bahr el Ghazal. The meteorological returns attached, also very incomplete, are from observations taken mostly by Egyptian officers of the Medical Corps, and were kindly tabulated by the Egyptian Survey Department.

The Southern Soudan from this point of view may be roughly divided as follows :—

I.—INLAND DISTRICTS.

Kordofan.—The large district lying between the White Nile's west bank and the frontier of Darfur.

Gezira, lying between the two Niles and reaching south to a line drawn obliquely from Kaka on the White Nile to Famaka on the Blue Nile (south of this the district is not much known and is not yet completely surveyed).

Eastern District.—The ground bounded on the north-west by the Nile, on the south-west by the River Rahad; on the north-east by the Atbara as far as Adarama and line of the Gash to Kassala; and in a south-easterly direction by the Italian and Abyssinian frontiers.

II.—RIVER DISTRICTS.

White Nile.—Including its southern affluents, the Sobat, Bahr el Gebel and Bahr el Arab.

Blue Nile.—Including its affluents the Rahad and the Dinder, and the ground between them.

CLIMATE.

Speaking broadly, the climate may be said to be very dry half of the year and rather damp for the other half. At Khartoum, from about November 15th, through December, January, February, March, April and May, a dry north wind blows from the arid desert regions, the wind gradually decreasing in strength the further south one goes, until at Shambé and Mongalla it is scarcely noticeable. In June and the beginning of July changeable winds alternate with calms, and towards the end of July the cool south wind from the rainy southern regions arrives. This damp wind continues to blow with varying force according to latitude—it being stronger the further south—till the end of October, when a second period of changeable winds and calms sets in, the wind finally setting in steadily from the north again. This sequence occurs with the greatest regularity, the north wind lessening in force and its period being shorter the further south ; the south wind season and the rainy reason being earlier and longer.

In Khartoum	..	the rains begin, as a rule, in July, and end in September.
„ Dueim	..	„ „ „ „ May „ „ October.
„ Wad Medani	..	„ „ „ „ May „ „ October.
„ Obeid	..	„ „ { sometimes April, } „ „ October (late). { usually May }
„ Fashoda	..	„ „ { showers in February, } „ „ November. { not steady till May }
„ South of Fashoda	..	„ „ as a rule, in March „ „ November (late).
„ Roseires	..	„ „ { sometimes April, } „ „ October. { steady in July }
„ Kassala	..	„ „ slight in April, May „ „ October (late).

These last two places are affected by the Abyssinian rains and are rather out of the general line. The rain is heavy at times, but seldom at all continuous.

In 1902 Rain fell in	Number of Days	Total Rainfall
		Mm.
Khartoum	3	36
Dueim	13	296
Wad Medani	28	517
Obeid	35	(Not measured)
Kassala	26	200
Fashoda	26	687 (1900; no observations in 1902)

The difference in the humidity between the north wind season and the south wind season is marked.

Place	Year	Mean Relative Humidity	North Wind	Mean Relative Humidity	South Wind
Omdurman ..	1900	17	March	68	August
Wad Medani ..	1902	14	March	66	August
Dueim	1902	9	April	61	August
Kassala	1902	32	April	64	August

The temperature is high during the greater part of the year (see attached tables), but the great heat by day is lessened in its depressing effects by the dryness of the atmosphere and the cool nights. It will be noticed by these tables that there are two periods of greatest heat, the months of July, August and September being always cooler as regards mean maximum than either the preceding or succeeding months. September and October are the most trying months, being marked by a high mean maximum, a rather high mean minimum, and a comparatively marked humidity.

A line drawn from Kaka on the White Nile to Famaka on the Blue Nile, according to Major Gwynn, C.M.G., D.S.O., R.E., forms rather a sharp boundary between the rainy regions proper, which lie south of this line, and the region north of it, in which the rains are irregular, and the climate approximates more to that of the Northern Soudan. Still, though the rains are not very heavy, compared to other parts of the world—they leave large pools—the White Nile overflows its banks, khors get full of water, and under the hot sun vegetation springs up very fast, insects abound, and malaria soon makes its appearance; camel transport cannot move, and sick in stations off the river have to remain where they are until the rainy season is finished, at any rate under present transport arrangements. A loop line from Kassala to the Suakin-Berber Railway, and a light line to Obeid would materially alter my subsequent remarks as regards the advisability of Kassala and Obeid being occupied by British troops; both projects are within practical politics.

Winds.—The prevailing north and south winds have already been mentioned. Squalls accompanied by sand storms, when the soil is suitable, are frequent and often severe; they occur most frequently before the rainy season, about twice a week, usually about 5 p.m. They continue till the wind sets north. There is nothing particular to note on this point, except that latrine trenches

for standing camps should be deep and not the usual shallow trenches.¹

Dew.—Except in the river districts there is none practically in the winter months; but south of Lake No the dew is very heavy all the year round, drenching to the skin anyone sleeping without a mackintosh sheet. It is heavy during and just after the rains in Kordofan and Kassala districts.

FOOD SUPPLIES.

This, as regards ordinary supplies, scarcely comes within my province, but meat is fairly abundant up both rivers and in the Gezira, also at Obeid and Kassala towns, but not at most intermediate inland posts. For sick a fair amount of milk, mostly goats' milk, is obtainable in the forementioned districts and places, also chickens and pigeons, and there are plenty of good fish in the rivers. Vegetables can be got in many places, though scarce generally; water melons are cultivated and also grow wild in the southern and western parts of Kordofan, in the latter being the only source of water supply for the cattle. A wild tamarind grows up both Niles; Brin John's and Barmia are cultivated by the natives. Gurra (a sort of marrow), rigl, and mulakhia, are obtainable at most of the larger towns; the latter should not be eaten when old as it gives rise to gastric disturbance and colic. In Bahr el Ghazal, any way to the west of Wau, tomatoes, onions and sweet potatoes are cultivated.

Water.—Away from the rivers in the dry season water is scarce, wells in most places being few and far between, and only holding a small supply, which compels troops to march in small parties, except when water depôts are formed. As regard quality, Blue Nile water is always excellent; in flood it is thick, containing much earthy matter in suspension, but is not on that account unhealthy. In the dry season it is like crystal. The White Nile always contains much vegetable matter, but more especially during the flood, partly from Sudd regions south, and partly from the washing out of khors or backwaters; it is, in my opinion, prone to cause diarrhœa. The well waters are as a rule good, though frequently not very palatable or clear. There are wells, especially in Kordofan, notably at Bir Serar, which contain salts which will cause diarrhœa. The wells at Kassala also contain rather a large percentage of salts

¹ In shallow trenching a large area of ground is soon fouled; in a light soil, where cultivation cannot be carried out, owing to lack of water, the top soil soon gets shifted and fœcal dust is blown into camp with every wind.

in solution, and one at least causes looseness of the bowels. Surface waters, which are not infrequently the only supply, should be boiled, if possible, to avoid guinea-worm if nothing else. The water supply question, however, is so large and so intricate, and varies so immensely according to local conditions, that I cannot treat it here.

Vegetation.—Usually fairly abundant, more particularly so up the river districts, but in many places, especially in Kordofan, scanty; even fuel is very scarce, being barely sufficient to cook food, certainly not sufficient to boil water. Most of the shrubs and trees are thorny; it is common for injuries to the eye to be caused by thorns, especially when marching by night, which is usual on account of the heat. In Kordofan a grass (native name Heskeneeth) grows extensively; the spikes break off the seed and get into the clothes, with every motion they work their way further in, and not infrequently penetrate the flesh, causing much irritation and frequently small abscesses, especially about the legs and wrists. It is worse than the common Indian spear grass; British officers have found putties bad, and always wear canvas or leather gaiters; serge khaki is useless, cotton khaki better. On the southern White Nile grows a tall grass which forms the Sudd blocks (native name Oom soof), this also has small spikes which act in much the same way as heskeneeth; it is not so penetrating, and although a good deal of superficial ulceration is caused in the legs of native working parties when Sudd cutting, it will not affect properly equipped troops. The ashar bush (Dead Sea apple) is well distributed, any of the milky-white juice getting into the eye will cause conjunctivitis. *Datura stramonium* grows commonly, and cases of datura poisoning, by accident or design, are not uncommon.

INSECTS.

As regards insect life, and inefficiency so caused, mosquitoes will be discussed under the heading of Malaria. Sand-flies are common all over the Soudan. Beyond preventing sleep they have not much effect, but it is just possible that they are conveyers of malaria. In Obeid, where fever is rife, mosquitoes are few and sand-flies very numerous. Dr. Balfour, of the Gordon College, has made some dissections, with the view of clearing up this point, but as yet there is no evidence.

Leeches are conspicuous by their absence. Scorpions are common and cause a certain number of deaths annually amongst children; occasionally one sees severe cases in adults, the victims

being quite collapsed for the time. The Kordofan scorpions, a large black kind, are supposed to be specially virulent, and those found in Mount Melbis are credited by the natives with being able to kill a camel. The best treatment seems to be local incision and local injection of morphia; in my experience local application of ammonia is not much use. A paste made of ipecacuanha powder and ammonia seems to be more useful than plain ammonia. A large insect like a spider, but belonging to the same family as the scorpion, called "Abu Shephard," will cause a fairly severe local irritation by running over the bare skin, especially when frightened; this is done with its claws, which apparently secrete some irritant; ammonia locally is good. There is a large centipede which has the same effect. A beetle closely allied to the "Cantharides" appears in many parts during the rainy season; it causes blisters by excreting some juice on the skin; it usually gets down the nape of the neck. Sometimes the blistering is really severe; in one case in which it had got into the trousers, it caused a blister on the leg three inches long and one inch wide. In the Bahr el Ghazal Captain Cummins states there is a fly whose eggs by some means get under the human skin, painful local abscesses resulting when the larvæ hatch; the larva ultimately is discharged, it is annulated and from a quarter to half an inch long; it, or a similar insect, is reported from parts of Kordofan, the natives state that there it is nocturnal and only affects those who sleep on the ground.

Up the rivers, on the White Nile especially, much annoyance is caused, particularly to transport animals, by the various "serut" flies (genera, *Tabanus* and *Pagonia*); one species, a small black sort of fly, only bites from about dawn to 10 a.m., and from 4 p.m. to sunset; this is so well known that the natives do not allow their cattle out to graze except between 10 a.m. and 4 p.m., the rest of the time the cattle being kept in an enclosure with a smoke fire burning to keep off the fly. The tsetse fly (*Glossina morsitans*) is found in the Bahr el Ghazal (Lieutenant-Colonel Griffith, D.S.O., A.V.D.). In view of Colonel Bruce's recent report regarding Sleeping Sickness this is important. Ticks are fairly common in Kordofan; they may be neglected as a cause of inefficiency; there are no jiggers. Snakes are not common and may be neglected also. In four years I have only seen one case of snake-bite amongst natives.

GENERAL DISEASES.

Although the thermometer runs high over nearly all the Soudan, heatstroke is not at all common, presumably accounted for by the

dryness of the atmosphere in the hot weather, especially in the northern portion. But there are days in the autumn, especially in October, when the sun is passing south for the winter solstice, on which, especially after rain, the atmospheric conditions are very oppressive. The only recorded cases I can find are : One Soudanese officer died of sunstroke in the Bahr el Ghazal in February, 1900 (it was a hot day, slight rain fell the previous night). One Egyptian transport man died of sunstroke at Dueim in December, 1901. One British officer got sunstroke on White Nile at Gebel Ahmed Agha, in April, 1902. One British officer got sunstroke on Blue Nile, June, 1903. Three Soudanese privates died from sunstroke in Southern Kordofan in October, 1903, while making a forced march : it was a very hot, steamy day ; there had been rain the previous night. One Egyptian soldier died at Omdurman in August, 1903.

Simple Continued Fever, due to sun exposure, is not uncommon amongst teetotal Egyptians and practically teetotal black troops. As there have been three cases, one fatal, of sunstroke among British troops at Khartoum this year, sun fever and sunstroke, but especially the former, will undoubtedly have to be taken seriously into account as a cause of inefficiency for British troops.

Nyctylophia will perhaps affect a few men. Although not uncommon amongst natives, it attacks only those exposed for a long time to a strong glare, when anæmic or otherwise in bad health. In most places in the southern Soudan it is not necessary to wear goggles.

Pterygium will not cause inefficiency, although common, as it takes some years to develop. A sub-acute conjunctivitis, due to dust, will cause a certain amount of inefficiency.

Diarrhœa is common as in other places in the Tropics ; it is frequently due to chill, there being a great difference between the night and day temperatures, especially when the north wind is blowing, as much sometimes as 40° F. Bad water is a common cause, especially water from shallow wells, or from backwaters, when the river is low or just rising ; this is owing to the fact that natives usually use the river bank for purposes of nature, hence water parties should be carefully supervised. White Nile water, more especially in flood time, is liable to cause diarrhœa.

Dysentery is not uncommon, but I do not consider it common as a sequel to malarial fever. It was commoner in Khartoum and Omdurman than in other districts, as far as present observations go, and this is probably due to the insanitary state of these towns, the two chief causes being : (1) Well water fouled by the usual native cesspit, especially at the commencement of the rainy season ;

(2) faecal contamination of the ground. With improved sanitation its incidence is less, but at present amongst the native civil population enteritis, diarrhoea and dysentery are common and increase enormously during the rainy months. The infant mortality is very high from the first two diseases.

Pneumonia is very rare except amongst blacks, and occurs mostly in Kordofan; it seldom occurs amongst Egyptians, and only one case has occurred in a British officer (Kordofan).

Hepatic affections are fairly common, but not more so than in other tropical climates. Hepatitis, jaundice, and liver affections generally seem commoner in Kordofan than in other districts (Captain Stallard). They are commoner at the beginning of the rains and in winter than at other times, and so are probably due to chill.

Renal colic, due to gravel, is common amongst Egyptians, and occurs with some frequency amongst whites, presumably due to the concentrated condition of the urine in the dry weather.

PARASITIC DISEASES.

Bilharzia and *ankylostoma*, so common in Egypt, have not been noticed in the Soudan except in imported cases. Tape-worms occur, the common form being *Tænia mediocanellata*.

INFECTIOUS AND CONTAGIOUS DISEASES.

Small-pox occurs in small epidemics in autumn, as a rule, but with increasing vaccination is lessening yearly, and would be no danger to vaccinated troops.

Chicken-pox is common, and is confused by some natives with the disease mentioned further on under the name of boorglum.

Cholera.—There is no history of cholera since our occupation, but it is reported to have spread up the river from the north seventy years ago and to have played havoc (Father Ohrwalder).

Diphtheria occurs undoubtedly; one British officer suffered from it on the Blue Nile in 1899.

Beri-beri.—Some doubtful cases have occurred in Kordofan. It was the dry form. A disease is known to the natives as "Abu Agele," that is, "the father of the tying up" (of the legs), the verb "Agel" being to leg-halter a camel. This disease is said to be contagious: it is perhaps endemic; it is possibly beri-beri.

Enteric Fever.—Sporadic cases have occurred in nearly every station in every district, and British troops will be just as liable to this disease as in every other place abroad.

Syphilis is extremely common; there is nothing noteworthy about the type, except the mildness of the secondary and tertiary symptoms generally. Rapidly sloughing phagedænic sores are not uncommon and require active interference.

Typhus fever was reported to be common in Kassala by the Italians when we took it over first, but none has been reported since. It was most probably cerebro-spinal meningitis.

Epidemic cerebro-spinal meningitis caused many deaths in 1899, especially in Omdurman, but the epidemic was taken energetically in hand, and since that year no cases have been reported from anywhere in the Soudan. This disease had evidently been rife in Omdurman in the time of the Dervishes.

OTHER DISEASES.

Simple Continued Fever, as mentioned before, is common, and will cause a good deal of inefficiency. Numerous cases returned under this heading, and also sometimes under malaria, are, in all probability, "undulating" or "Malta fever." One case in a British officer from Berber has proved to be so bacteriologically. The diseases which require special mention are: (1) Malarial fever (including blackwater fever); (2) guinea-worm; (3) Kordofan sores; (4) boorglum. The first two are responsible for the major part of the sickness in the Southern Soudan proper; the latter two are peculiar in a sense to the Soudan and hence worthy of notice.

(1) *Malarial Fever*.—As examples of the importance of this disease I quote the following: The 4th Egyptian Battalion (about 700 strong), occupied Fashoda on the White Nile from December, 1898, to May, 1899. This was not the fever season proper, but the men were run down by the campaign, which terminated in the battle of Omdurman. The battalion was brought north, and a few days after arrival at Khartoum the parade state was one sergeant and seven men, everyone else being either incapacitated by fever or having been invalided. In the autumn of 1898 a detachment of Egyptian Cavalry (strength 150), also below par, on account of campaigning hardships, marched up the Blue Nile. The men were nearly all brought down by steamer, sick with fever in about a month. Natives had to be hired to feed and water the horses, and subsequently a detachment of Soudanese Infantry had to be sent up to bring the horses down. The 2nd Egyptian Battalion (strength about 600), was garrisoned at El Obeid, Kordofan, in the year 1900. The battalion carried on well till August, when malarial fever appeared shortly after the rains. The temporary hospital and

barrack rooms became crowded with sick. The battalion was brought down to Cairo, but practically took two years to recover itself, *i.e.*, get its sick rate back to normal. The net result of one fever season to this battalion was twenty-four men died and twenty-four men were invalided out of the service in 1900; five men died and fifty-eight men were invalided in 1901; and also by January 12th, 1902, 135 men had been sent to special unpaid furlough for variable periods from six months to two years, which was equivalent to invaliding, as regards colour service, for most of them.

The following figures are interesting:—

Year	Average strength of the Army	Total admissions	Admissions for malaria	Percentage of total admissions	Total deaths	Deaths due to malaria	Percentage of total deaths
1900	22,521	18,291	4,979	27·2	268	77	28·7
1901	18,399	13,535	2,673	19·6	176	37	21·0
1902	16,939	11,265	2,104	18·6	116	20	17·1

As an example of what troops can do in the Southern Soudan when not affected with malaria, I quote the following: In November, 1901, a cavalry patrol (strength 100 Egyptian and 50 Soudanese) marched up the Atbara and then down the River Rahad to Abu Haraz. The force was out two months, and only one case of fever occurred on the Rahad. The only noteworthy sickness was caused by the men over-eating themselves with raw turnips at Gedaref!

As in other countries, the rainy season, or rather the last half of it, and just after the rainy season, is the "fever season." This, according to light of present-day knowledge, is due to increased facilities for mosquito breeding, and the delay is due to the mosquito having to breed, to then get infected, then to infect, and then about fourteen days being required for the development of the plasmodium. The fever always begins shortly after the rains begin, and terminates almost as soon as the country has dried up. The amount of sickness varies immensely from year to year, according to the amount of rainfall, but as a rule the fever season may be taken to be the months August, September, October and November. The accompanying table, though not showing the proportion between rainfall and fever well, and vitiated by the fact that black battalions (who are undoubtedly much less often attacked, and when attacked suffered less severely than Egyptians) occupied Obeid in 1902, still sufficiently proves the point as regards August, September, October and November being the fever months. Obeid repre-

sents Kordofan district, Kassala the eastern district, Wad Medani and Roseires the Blue Nile. Wad Medani is scarcely, however, in the fever belt; also as regards Wad Medani and Roseires, the stations being on the river, and communication being now easy and regular, and the men only being on detachment duty, the men are constantly changed and often, if only suffering slightly, are not admitted to hospital. Roseires is added to the table. The average constantly sick is low, but this gives a false idea of the healthiness of the station, for the admissions during the fever season (one-third of the year) in two different years nearly equal, and in one year more than halve, the total admissions for the whole year. I cannot give the same statistics for Fashoda at all. In 1899 it was evacuated on June 29th, before the real fever season. In 1900 it was not occupied at all. In 1901 it was occupied from November 16th only; its average strength to the end of that year was only 173, yet these gave 85 admissions, of which 57 were for malaria. In 1902 it was occupied from January to the beginning of February, and then from May to the end of the year. Average strength 254, yet these gave 407 admissions, of which 115 were for malaria. At any rate, it is a well-known fact that the fever season begins earlier and lasts longer than in stations further north, owing to the earlier and longer rains, and may be taken as June to the end of November. The mortality is not severe, in 1900 being 1·54 of all admissions for fever, in 1901 ·72, in 1902 ·95. But the actual case mortality will be higher, as many men were admitted three or four times. On the other hand, to balance this, many cases, especially mild ones, were treated in barracks and as "attending hospital," and never came into the admission and discharge books.

As regards the type of fever, I regret that, owing to sundry circumstances, no records of definite microscopical work can be appealed to as regards the Soudan. Though theoretically any case of fever can be diagnosed and classified after an hour's work with the microscope, practically it is not so; certain conditions must be complied with which mostly do not obtain in the Soudan. In course of time, as stations get better equipped and native officers more familiar with microscopical work, we shall be able to obtain this information. Under the circumstances, I have considered it advisable to speak in terms of the old clinical classification, although aware that this is rather behind the times. Clinically it may be said that, as a general rule, the further south the severer the fever. In Kordofan district the commonest form of fever is tertian; of 929 admissions in one year, 912 were intermittent, and

only 17 remittent. The temperature does not as a rule run high, but not uncommonly extremely severe cases occur, especially at the tail end of a rainy season. These cases usually occur in men who have been sick previously. The patient suddenly becomes comatose with a high temperature, and either dying in that state or subsequently from sequelæ, the commonest sequel seeming to be "cancrum oris." Only one case of this recovered as far as I know, and in this case the noma occurred in Omdurman; the man lost most of both of his superior and inferior maxillæ. The same occurrence of noma has been reported from the Bar el Ghazal. Intramuscular or hypodermic injection of the hydrochlorate of quinine (dose usually 10 grains) was extensively used by Captain Stallard in 1901, with most satisfactory results. With due precautions for sterilisation it is safe; in no case did abscesses result therefrom. It is, in fact, the only line to be adopted in severe cases of high temperature and foul tongue. No cases of blackwater fever occurred, nor any accompanied by jaundice; gastric symptoms as a rule are not at all marked. Cases occur of continued fever lasting up to forty days. They are not amenable to quinine; they are accompanied by lumbago, and will probably ultimately prove to be Malta fever.

As regards the Gezira district there is little information, owing to the fact that no troops have been stationed anywhere off the river, and there are no civil hospitals inland as yet. Fever does occur and is often severe, judging by the few civilian employées who have come down sick. Once, at Messalamia, which, however, has a large stagnant pond close to the town, I saw all the small Police detachment and the few clerks down at once with fever, the only official not sick being a half-caste black. In the Kassala district there is comparatively little fever unless there is heavy rain. In Kassala itself the fever is not severe, but from Gedaref southwards the fever is severe, the temperature as a rule running high. As usual, marked hepatic and splenic enlargements are the rule among Egyptians; the Arabs suffer considerably, but the blacks not so much.

River Districts.—On the White Nile the fever is chiefly intermittent, but remittents are commoner than in Kordofan. In 1899, of 761 additions, 471 were intermittent and 290 remittent. The severity and mortality is statistically less, but this may be due to the fact that the sick can always be got down by boat, and as a rule, as soon as they leave a malarious district the cases improve, whereas those who get sick in Kordofan have, as a rule, to stay there until

they are fit to travel by camel. In the Bahr el Ghazal near the rivers the fever season is permanent. Inland it occurs during and after the rains, and may be said to be from April to November. The type is often severe, accompanied by gastric symptoms. It is in this district only that the fatal blackwater fever occurs. There have been a few cases, but up to date only very few Europeans and few Egyptians have been stationed there. The blacks do not seem to suffer from it, any way, no case has occurred as yet in a black. It is worthy of remark how often the fever declares itself after the patient has left the district. One Egyptian officer had a severe attack in Cairo after having been invalided for ordinary malaria from Fashoda, and one British officer died at Marseilles on the way home for leave after serving in the Bahr el Ghazal. I have no personal experience of the fever. It is known that its mortality is exceedingly high, that it is nearly always preceded by malarial attacks, and the cases we have had here corroborate these points; also marked epigastric oppression has been a prominent symptom. No case occurred in 1901 when first we occupied this district, although the troops suffered much hardship; eight cases occurred in 1902, of which four proved fatal. Quinine was used, and large doses of calomel (grains 10 to 15) seem to be well tolerated and have a very quieting effect on the epigastric distress. The French lost several men at Wau (Fort Dessaux), who are reported to have died of blackwater fever (Captain Cummins). On the Blue Nile the fever is chiefly remittent, accompanied by gastric symptoms, not infrequently severe. In 1898 the type of fever was extremely severe, with symptoms often resembling enteric fever in the great tendency to rapid adynamia, prostration and collapse; the debility after fever was extreme and relapses frequent. Out of 24 British officers, 19 went sick, 7 were invalided, and 1 died (Major Penton, D.S.O., report).

Steps have been taken this year to tackle the fever question from the mosquito point of view. In Obeid, Kassala, Wad Medani, and Khartoum itself, ground has been drained, pools filled up, others systematically oiled, and it is confidently expected that in future years the amount of fever will be much less. It is interesting that Captain Ensor, D.S.O., reports from Kassala that not only have mosquitoes diminished, but other insects, midges, &c., which often were terribly annoying when near a light, have also practically disappeared as a result of these measures. Minor attempts are being made at White Nile stations and in the Bahr el Ghazal, but funds are small and swamps are vast. At Nassa, on the Sobat

River, draining the station has given very satisfactory results. Quinine prophylactically has been and is being tried, but its results seem very erratic ; it is usually given in 6-grain doses twice a week. The bisulphate is the best, being more soluble and causing less gastric irritation than the sulphate. Large doses of quinine, 10 grains daily, have been issued to all British officers and British N.C.O.'s in the Bahr el Ghazal this year, 1903, by Captain Nickerson, with most satisfactory results. Not a single officer has had severe fever. Mosquitoes are common anywhere near water, and latterly even in Khartoum itself, a recent development due to the increase in gardening. *Culex* and *Stegomyia* abound, and *Anopheles* can be fairly easily obtained anywhere south of Wad Medani on the Blue, or Shawal on the White Nile ; they have recently been found in Khartoum itself. Dr. Balfour, of the Gordon College, is now engaged in collecting and classifying the mosquitoes of the Soudan. Mosquito nets have been issued, but are not regularly used by the native troops, and as regards blacks, ample opportunity for infection occurs when in the harimat lines. In issuing mosquito nets the following points will require attention : (1) Each man must have a net to himself ; large nets for two or more persons have been tried for native troops ; they are no use, being difficult to stretch, easily torn, and one man getting out at night for the purposes of Nature lets the mosquitoes in. (2) The nets should be rhomboidal ; the round-topped or the extinguisher-shaped curtains are of little use, firstly, because the sides not being sufficiently far away from the occupant, he always gets bitten through the meshes on his hands, arms, or feet. To keep the sides taut it must be very tightly stretched, and this frequently leads to tearing ; secondly, the extinguisher pattern gets creased with folds at the top. A mosquito has been proved to be unable to pass through a wire meshing of fourteen meshes to the inch on the straight, the difficulty apparently being owing to the length of his legs ; but if he creeps up a fold by leverage against the opposite side of the fold, the mosquito can and does force his way through a much smaller mesh. They should be made of the ordinary fine muslin (not the close mesh which prevents air circulating), and this muslin should not be washed. When new the ordinary mosquito net has numerous fine fibres extending from the thread into the centre of each mesh ; especially if the muslin is well stiffened with size or starch. These fibres so block the mesh as to keep out even sand-flies when new ; if washed these fibres disappear, and the smallest insects (sand-flies any way), can get through. (3) The top should be of stout calico

in order to keep off the dew, as well as for strength. (4) It should be stoutly taped at the corners for fixing. (5) There should be a bottom flap of calico a foot wide, with a 6-inch open pocket running round the edge. The flap is for tucking in under the mattress or blankets, but as it is very difficult to make it stay tucked in under a single blanket and ground sheet, the pocket should be filled with earth or sand, this keeps it steady on the ground when camping out. On the march a certain number of stout poles about 7 feet long, lightly shod with iron, and bored or ringed at the top, should be carried by each section, also a piece of light strong rope. The four poles are driven into the ground at a suitable distance apart, the ropes stretched between them, the poles stayed to pegs if necessary; several men can then sleep on the ground in a row, the curtains being tied to the taut ropes by the corner tapes. In garrison, native angareebis should be supplied, and with a few pieces of wood the curtain can easily be fixed.

As regards the site of camp, mosquitoes can to a large extent be avoided by a little judicious selection of ground. On the White Nile, at least, in many places a short way inland from the river, the black cotton soil ceases and the gravelly soil will be seen; select your camp on this as far away from water as you conveniently can. A green wood fire to windward of the camp will also be found useful. Always camp away from a native village to diminish your chance of infection. Sentries should be supplied with veils after sundown. Probably a wire mask, similar to a fencing mask, but made of ordinary light mosquito blind wire instead of the usual stout wire, would be better; any gauze veil must be kept sufficiently far away from the chin and angles of the jaws to prevent the man being bitten through the veil, and under these circumstances the man would not be able to see, and would not be much use as a sentry; a muslin flap hanging down from the edge to cover the throat, or a light wrap would be required. Men should be encouraged to grow beards. Gloves should also be worn by sentries at night, and the sleeve tied by string or kept tight to the wrist by a rubber band.

Guinea-worm.—Doubtful if it occurs in Kassala itself, occurs in Gedaref and frequently in Gallabat. With more frequency on the Blue Nile, but probably chiefly in villages which use surface water or shallow wells, and apparently not in villages where river water is regularly drunk. It is common on the White Nile, and exceedingly common in the Bahr el Ghazal, and also is extremely prevalent in Kordofan.

It is conclusively proved by statistics of troops stationed in, and moved from, Guinea-worm districts, that the worm takes from nine months to a year to develop, so, as regards British troops, it may practically be neglected as a cause of immediate inefficiency. Also it is undoubtedly most prevalent in natives who drink surface waters, especially in tribes who store such waters in hollow trees (the Tabuldi tree). Although very prevalent generally in Kordofan, Captain Stallard states that the permanent inhabitants of El Obeid, who drink from deep wells, seldom get it. Only one case has occurred in five years amongst Englishmen. This was a Royal Engineer officer, who got infected while surveying up the Blue Nile.

The worm generally comes to the surface in the legs usually near the ankle, but it may appear anywhere. I have seen them in the hands, once in the scrotum, and in the buttock. They occasionally cure themselves by getting coiled up and encysted; one such was found near the femur in a leg that was amputated at the hip-joint for gunshot wound. They are not infrequently multiple. Captain Cummins extracted six from one patient.

The soundest treatment seems to be to leave them alone until they have evacuated their eggs and show a tendency to come out of their own accord. We have tried injecting the worm itself with perchloride solution, and also injecting the same into the tissues in the worm's tract, but the result of killing, hardening, and trying to extract the worm leads to breakage and prolonged suppuration quite as frequently as the old method of simply twisting it on a stick. Captain Cummins, who treated many cases in the Bahr el Ghazal, is distinctly in favour of injecting perchloride solution into the surrounding tissues. The best line appears to be, whatever method is adopted, not to begin too early.

Kordofan Sores.—In Kordofan a certain amount of inefficiency will be certain to be caused by sores, as a rule on the face, hands and wrists. They are similar in type to what is popularly known in India as "Scinde sores" in Scinde, "Waziristan sores" on the frontier, and what I imagine from the description is exactly the same as the "Veldt sore" in South Africa. Whether due to a special micro-organism or not, no investigations have been made. They may start as a papule, or from some mosquito bite, or from a scratch from heskeneeth. They are superficial sores with frequently a serpiginous margin, a rather hard, roughly granular base, sometimes rather warty in appearance. There is very little secretion, and little or no pain. They are obstinate to heal. I have not noticed any accompanied by enlargement of the nearest

lymphatic glands. They vary in area from a quarter of an inch to 3 or 4 inches. They may be checked at the outset, especially when hardly more than a broken-down papule, by the application of a strong antiseptic, *e.g.*, a crystal of pure carbolic acid or hydrarg. perchloride. Afterwards, when they have spread, application of various ointments may succeed, but frequently they keep healing and breaking down again, until they have been well scraped and thoroughly scrubbed with an antiseptic.

Boorglum (so called by the natives) is a disease which appears commonly amongst the Soudanese, and is said by them to occur more commonly at flood Nile. It is a superficial rash, which affects nearly always the backs of the hands and forearm and the dorsum of the feet and the front of the leg. It is very likely to be mistaken for itch, but it does not itch. The rash consists of numerous rather closely-set papules, frequently vesicular or pustular. When scabbed might be mistaken for syphilis, except it is on the wrong surface of the limb. It is probably parasitic. It is very common amongst men working with mud bricks. A similar disease is reported from Gallabat, and is reported to be cured by the natives by rubbing with a brick (Major Penton, D.S.O.), perhaps on the homœopathic principle. Up to date no treatment seems specific. Certainly in my experience sulphur ointment and liquor calcis sulphureus are useless; painting with iodine seems to give best results.

The following general conclusions may be drawn from these notes, it being understood that where troops could operate under active service conditions they could garrison. There is no medical reason to the contrary why British troops should not operate.

I.—INLAND DISTRICTS.

In Kordofan District :—

(1) Without any special precautions against malaria during the months of December, January and February: (a) except if operating in southerly direction towards Bahr el Ghazal, say south of Gebel Gedir; (b) except as regards the ten-mile strip on White Nile western bank, in passing through which precautions should be taken.

Men should have two blankets and a jersey, as it is very cold at night—mean (7 a.m.) temperature in December, 59° F.; January and February, 53° F. (Prout).

(2) They could also operate up to the beginning of May with due precautions as regards heat only, but a good deal of sickness

may be expected on this account in March and April. During these periods no tents required. Blankets should be eyelet-holed to stretch as sun shelters during the day if required.

(3) They should all be brought back to the river to go north by the end of May. It is then very hot: the rains begin. In spite of all precautions malaria will be rife, and under the present transport arrangements sick could not be moved, and the troops would take a long time to recover the effects of one fever season.

Gezira District :—

(1) They could operate on this ground in December, January and February, without malarial precautions, except in malarious belt 10 miles from the river.

No precautions necessary in this district south of a line drawn from Wad Medani on the Blue Nile to Dueim on the White Nile. One blanket and jersey is sufficient, or two blankets and no jersey.

(2) Could operate up to May, taking due regard to heat.

Eastern District :—

(1) The same applies to this district, except that, although the rivers Atbara, Setit and Rahad will be dry, pools are left, and precautions against malaria should be taken when in the neighbourhood of pools or villages.

(2) The same remarks apply as for Gezira district.

(3) They should all be brought to Kassala by the end of May, but could garrison Kassala, with due precautions taken, without much sickness, especially if the rainfall is light.

II.—RIVER DISTRICTS.

Blue Nile.—Could not operate or garrison this river or the Dinder at any time without precautions against malaria. They could garrison stations on the river, but there would be much sickness. Not advisable to go inland east.

White Nile.—The same fever precautions required; not advisable for troops to stay on the river, or at any post after April. They could operate in the Bahr el Ghazal with fever precautions in January and February. It would, however, be very hot; after February the rains begin. They should not attempt to garrison any post there, but should all be back and going down the river by the beginning of March. Even then a high sick-rate should be expected, and perhaps deaths from blackwater fever.

In these remarks, when I say no malarial precautions necessary, I do not mean to say that there will not be individual cases of malaria contracted from infected mosquitoes from villages, wells,

&c., but that the general health of the troops will be good, and no undue amount of inefficiency will be caused by malaria.

As regards the transport of sick, this in the Soudan resolves itself into boat, hand transport, and camel transport. The first requires no discussion, being plain sailing; the second is practically out of the question, owing to the long distances and the few inhabitants. As regards the third, men well enough to sit up can travel—uncomfortably it is true—in the ordinary cacolet fitted to a camel saddle. The numerous devices for carrying a lying-down patient on one camel, or slung between two camels, are all equally uncomfortable and nearly equally inefficient, and would require a second chapter.

	OBEID			KASSALA			WAD MEDANI			ROSEIRES		
	Egyptian Battalion	Egyptian Battalion	Soudanese Battalion	Soudanese Battalion	Soudanese Battalion	Soudanese Battalion	Soudanese Battalion	Soudanese Battalion	Soudanese Battalion	Soudanese Battalion	Soudanese Battalion	Soudanese Battalion
	1900	1901	1902	1900	1901	1902	1900	1901	1902	1900	1901	1902
Rainfall total (m.m.)	—	—	—	257	248	200·3	—	—	—	615	—	—
Number of days rain fell	—	24	35	13	26	26	—	—	—	—	—	—
Percentage of admissions during fever season	85·09	78·61	64·9	70·8	35·0	33·6	65·2	24·5	40·3	35·0	49·6	43·9
Obtained from total admission, all diseases, Aug. to Nov. only	1,569	871	1,141	776	134	152	343	102	135	81	85	80
Total admissions during eight remaining months of year	275	237	617	320	248	300	183	351	200	149	102	84
Total admissions for year	1,844	1,108	1,758	1,096	382	452	526	453	335	230	187	164
Being for malaria	1,568	794	984	637	76	47	253	73	64	161	93	72
For other diseases	276	314	774	459	306	405	273	380	271	69	94	92
	1,844	1,108	1,758	1,096	382	452	526	453	335	230	187	164
Average strength of station ..	591	464	975	1,000	1,150	950	647	550	80	135	135	136
Average constantly sick	37·91	33·63	40·98	28·4	16·17	15·82	17·76	15·95	11·83	6·98	4·67	5·30
Deaths from malaria	26	11	3	2	3	1	2	2	1	0	0	0

TRAVEL IN SOMALILAND.

BY MAJOR J. S. EDYE.

Royal Army Medical Corps.

UNTIL recently few people really knew where Somaliland was exactly situated, and at best could generally only answer the question by saying, "It's somewhere in Africa, is it not?" Well, they are right there; but in Africa we have Egypt, we have the Gold Coast, we have the theatre of the late war, Uganda, the Congo, and so on. Well, it is not near any of these parts, but get up to the Red Sea and Indian Ocean, and begin to think about East Africa and Abyssinia—which latter is far inland from the east coast—and you will be getting near it. It is that promontory of land known as the Horn of Africa, and situated on the eastern coast, approximately speaking, opposite the arid port of Aden, due south of it, and separated from Aden only by 150 miles of the Gulf of Aden. Roughly speaking, we exercise control over about 400 square miles from the coast and inland towards Abyssinia, and that area is called British Somaliland. There are three ports, working from the north along the coast towards the south, namely, Zeila, Bulhar and Berbera; the first and last named are, or used to be, presided over by a British officer known as the Resident, and who lives in a large gaunt building, much in need of repair, and with a dilapidated coat of arms, much in need of paint, known as the Residency. How my spirits fell when I first sighted these ports! Arid, dusty, sunbaked, glaring places, with little or no trees or vegetation to be seen. Irregular masses, or straggling lines of low, square, flat-topped, white—mostly single-storied—mud-walled houses and shanties, with—camped on the open spaces—camel caravans from the interior, in the dust and heat and glare. Half a dozen long bent sticks, both ends thrust into the ground so as to form an arch or curve, crossing one another in different directions, and several large, dirty, yellowish grass mats thrown over them, form a Somali's shelter. These mats are about seven feet long by five wide, and three of them, tied together in a certain manner by ropes, go to form a camel saddle ready for use with long ends of rope left hanging, for tying on the load, and for girthing on the "saddle." The Somali baggage camel is smaller than the Indian camel, and does not carry nearly so great a load. There are two kinds, one lean and wiry for baggage, and one that is

fattened for food. Beware which you buy. But before leaving the coast, I must not forget to mention the loud, noisy jabbering Somali "boy." The monkey-house at the Zoo is not "in it" with him. He is incessantly talking and shouting at the top of his voice. Some of them with clean shaven heads, others with close, tight curls, about 1 to 2 inches long, of black hair, and some of them with their heads plastered over with lime, the aforementioned black curls being in the process of bleaching to a golden yellow. But they are withal a cheery, plucky race, and will follow up and pull the tail of a wounded lion, if they know you will stand by them.

Having obtained permission to visit Somaliland from the Political Agent, Somaliland Coast, Aden, and some letters in Somali and Abyssinian to the prominent chiefs, also a dozen carbines and ammunition to arm my followers—without which no one is allowed to travel in the interior—I entered the country from Berbera, because here you can buy a few more things than you can at Zeila or Bulhar. It is best to get camels and ponies sent in for you from the grazing grounds, some 60 to 120 miles off. Here also the natives have more things to spare for sale, as well as for bartering with the caravans from the interior. You will also get someone to part with the invaluable wooden water barrel, or the almost equally useful grass hân, a pyramidal-shaped vessel, made of plaited grass, and smeared over with ghee (clarified butter), and sometimes adorned with cowrie shells. Travel in the interior is often accompanied with days of absence of water. You fill up your water-vessels at every water-hole, and sometimes these holes may be one hundred miles apart. Then you water your camels, who can go for a fortnight; and your donkeys, who can do for three days, and your ponies and Somali "boys," who can go for two days without a drink; and for yourself, well, you must not wash much, and what you do use you must give to your ponies and donkeys to drink. In this way the average traveller can do on about ten or twelve camels for a three months' trip in the interior. About half of the said camels will be carrying four small water barrels or hâns apiece, and the other half will be carrying "master's" tent, bedding, rifle, ammunition, provisions, &c., and for each of his nine or ten followers, a daily allowance of 1 lb. rice, $\frac{1}{2}$ lb. of squashed dates, and 2 ozs. of ghee. For meat one must entirely rely on one's rifle, unless one meets with a wandering tribe, and induces one of them to sell a fat-tailed sheep for about seven shillings and sixpence. About 800 of these sheep leave Berbera weekly, to victual our troops in Aden,

by the little red and blue steamer which does the round of the ports, viz., starting from Aden, she visits Perim Island, Zeila, Bulhar, Berbera, and back to Aden, taking about four and a half to five days.

A Somali will only take charge of two camels. It is necessary to take a cook, a syce (groom), and a couple of native hunters. Then make a start, every beast being watered right up to the brim, and having insisted on your men seeing their rations weighed out before them, for so many weeks or months. The rice must be examined to see that it is not weevil-eaten, and so save grumbling and trouble with your men; and plenty of string and two or three packing needles for sewing up the bags, after each daily issue, must not be forgotten. The rice is sold in sausage-shaped bags of about 60 lbs. or rather less, and of which five bags go to a camel load. It is as well to make one camel-man act as headman, and to place the food in his charge and give him a slight increase of wages to issue it daily, and be responsible for its lasting out. He should be able to speak Hindustani, too, or better still, English, so that you can understand him. Some knowledge of the seasons may not be without value. To put it briefly, the rainy season commences in March and ends in June; then the grass for one's ponies, and thorny tree-tops for one's camels, are in abundance; but later in the year the grass dries up and gets eaten down, and though it is a good time for sport, one has to give one's animals at least four hours of daylight grazing. Soon after leaving the coast one begins to get on to high ground, and though a sun-hat is required and the lightest of clothes in the day, with a spinal pad for one's back, the nights and early mornings are intensely cold, and a great coat is much needed, so that you can throw it off about 9 a.m. It is well to give all your followers a month's pay in advance to leave with their wives and families.

A Somali camel is not a beast to take a heavy burden or to travel fast. He is well satisfied with 275 lbs. as a load, and two miles an hour is his pace. A nine-hour march divided into two stages—a morning and an evening one—is the custom. One should start at daylight, and after five hours call a halt, and take off every stitch of stuff from your camel's back, and let him graze off the tree-tops for an hour or two, while your cook gets your breakfast, and your men eat their $\frac{1}{2}$ lb. dates. You must take care to have a man armed with a loaded carbine round your camels while grazing, to keep off men and lions. One day when thus halted, two men travelling with two laden camels caught us up, and asked

if they might travel with us for a few days for protection, to which we agreed. They off-saddled for an hour, but on proceeding to catch their camels to load them up, they found one had given birth to a young one; but nothing loth, they tied the two loads on the one camel, and away we went, the mother trotting alongside licking its offspring. It takes a good hour to catch your camels and load up after this halt for breakfast, and you have another four hours march to do, if you are travelling quickly, and at dusk you have to find an old zareba, or cut down thorned branches and build one of your own. This is very necessary, or sooner or later you or your camp will suffer from men or lions. A zareba takes about an hour to build properly, all hands working hard. When finished it will be almost dark, the camels and ponies are driven in, you pitch your tent or lie down to windward of your circle of squatting camels, for they smell horribly, and a man is posted with loaded carbine to patrol inside the zareba. You should examine your camels' backs daily, and carry carbolic acid, a long curved lancet, and a "director," to slit up abscesses. If carbolic acid is not then freely used flies will lay their eggs, and then frightful maggoty backs will be the result.

For the first 100 miles from Berbera your water camels need not have their barrels filled, but you must load on top of the barrels hay bought in Berbera for your ponies and donkeys, as they will at first find very poor grazing, and will not eat grain. For this 100 miles you can camp near water each night. And such water it is, too, and it is the same right through the country, viz., like a cup of cocoa, for it holds a fine red slimy mud from constant disturbing of the water-holes by caravans, or in the interior by wandering tribes, who never camp near water, but who go once or twice a week, perhaps, to a water-hole, water their flocks of camels and sheep, the women carrying away the water for the community in hâns upon their heads. If one lets the water in a barrel settle down, by having a days' halt, it becomes as clear as crystal, with a thick reddish-brown sediment at the bottom. Then is the time to run it through your portable filters, for if you do so before, the sediment clogs the pores of your filtering media, and they soon stop working.

And what do you have ponies and donkeys for, did I hear you ask? Well, donkeys you have to tie out as bait for lions, and ponies you have, one to ride yourself to save yourself marching, and one of two others for your cook and perhaps others to ride, turn and turn about, so that they may be fresh on arrival in camp

to wait on you, and another important use of them is for galloping after lions, or for "ringing" elephants.

There are two methods of killing the lion. The one is to find his fresh tracks of the night before and follow them up quietly on foot, ever ready, finger on trigger, till he jumps up from under the bush where he has been sleeping, and if you wound or miss him and he bolts—and there are often three together, a lion and two lionesses—you shout to your mounted men who are behind you to gallop, and each singling out a lion, "pumps him," after a sharp half mile or so, and brings him to bay, and you "walk him up," having run hard, following the tracks of your pony's hard hoofs. You find the lions generally crouch quietly in the grass, but the lionesses are always very angry and savage. It is the finest sport I know, and I have now shot most animals. There is another system, and one I tried, but never with success. You reach a place where you find lions roaring at night all round you. You then have a little 10-foot square zareba built, 200 yards from your own big zareba, a hole is cut in the side, and a donkey tethered outside the hole, while you lie down inside, rifle ready, the thorn fence is closed in, and you are left for the night. If the lion goes for the donkey the commotion awakens you, and anyhow you have as good a sleep as you would in your tent. A lion is very bold after dark, and is attracted by your camp fires and noise: he comes round in the hope of getting a donkey, so if he sees yours he would probably go for it. I never got one, I am glad to say, by this method; but I was once sleeping serenely in a tent in my big zareba, with some donkeys tethered to saplings two paces in front of the tent, when a lion bounded into the zareba, scattered my beasts and men far and wide, took a donkey and proceeded to drag him off. I rushed out and followed him up by his growlings, for it was very dark, and after firing about ten shots in his direction he was suddenly quiet. On getting some torches made, I found I had hit him under the eye and in the nape of the neck, and there he lay, his jaws fixed on the donkey's neck, as they were whilst dragging the poor little beast off. It was a great night, in pyjamas and shoeless feet, all among the thorns.

You should have a complete list of the names of your servants before you start, asking the Resident to have it verified for you, and you should see that you do not have more than two or three men of any one tribe, so that there cannot be any combination. In my time there was no telegraph to the coast, but one's correspondence may be addressed to Messrs. Mahomed Hindi, Berbera. The post

clerk of the Resident of Berbera will probably kindly receive it for you, and send it out to Hergasia, to the blind "holy man" there, with whom you will arrange to receive the packet for you. He will also safely store any surplus bags of rice you may have. Almost all travellers going into the interior will go to Hergasia first, which is about 105 miles from the coast, and to this point one can, from time to time, send a messenger for letters. A few rupees to this "holy one" for his trouble, as well as to pay those bringing packets of letters with their caravans, are well spent. It is necessary to arrange for some distinctive mark to be put on your packet, such as X, for other travellers may also be doing the same thing, and it is annoying to find your letters have gone to a point one or two hundred miles from you. Replies can be sent into Berbera in the same manner; the "holy one" and the post clerk arranging it with caravans going to and fro.

Before leaving Berbera some "tobes," as presents, should be bought. These are red, white and drab loin clothes, and are of more value in the interior than money. The red is for any important chief you may meet. Soap, small looking-glasses, a sack or two of tobacco, and a few spare bottles of whisky or gin, together with the beads you buy in Berbera, will be greatly prized by their women-folk, too, and it is always well to keep in with them. At least one hundred rupees in small silver should be taken into the interior for every month, and another hundred rupees in rupees. The Somali will scarcely look at a two-anna bit; they expect four to eight annas for the smallest job; and for a little milk they expect a half to one rupee. Ghee they will hardly part with in the interior if you happen to run short, as you very likely will; for your men will daily try to get rather more than their proper allowance. I had to pay forty rupees for a small *hân* full. They are a cheery, good sort, and very fairly straight in their doings, and do not give much trouble. It is advisable to walk a good part of the marches after leaving Berbera, so as to get fit in limb and wind for any great exertion on which sport may depend, also to get your feet hard. Your syce and hunters must be able to ride well so as to gallop after lions, and you should see that they do not leave Berbera in white clothes, and if they do, soak them in coffee or Condyl's fluid, as the white clothing is fatally conspicuous in the sunlight. Cartridge belts, suitable for your men's ammunition, are useful, but only about thirty rounds per man is required. The Somali is very proud of being armed. On leaving Berbera it is advisable to despatch your caravan early in the morning to Dera Godlah, some

24 miles on the road to Hergasia, travelling due west, as you can ride after it in the cool of the evening, taking care to have retained your revolvers. You get on to high ground after covering some 30 miles, and during the greater part of your trip you are 5,000 feet above sea-level, and are about 7° or 8° from the Equator, north. The next day you should get to Lufferoo, about 15 miles, and the following to Argan or Ara Arbasia, really one and the same place, and about a 24-mile march. There is water at all these places, so one's camels are fairly lightly laden. Fifteen miles further brings one to Bumgarcion, and on past the Twin Hills into Hergasia. If one is shooting, one must now be guided by the information obtained as to the whereabouts of other parties, as of course one cannot go too near any other expedition for fear of disturbing the country; a certain amount of shooting must, anyhow, be done to supply the camp with meat. Northward will take one to the elephant valley of Hararwa, some 50 miles from Hergasia. Southward and south-west is Mill Mill, 100 miles or more, and across the Haud waterless plain, and so on to the Webi River and the giraffe country, Lake Rudolf, Uganda, and out at Mombasa. Or one may continue westward, 100 miles across the Haud, to Jiggigga, beyond which place will be seen a range of hills running north and south; on crossing these one is in Abyssinian territory. To the south of Jiggigga is Coiffirabya, a great place for lions, but no water, and if you halt here you must at once despatch a couple of camels and two armed men for water. Further south and west is the Jerer Valley, Garho, and Golwhelleh, a very favourite haunt of the rhinoceros, but five or six days from water. Passing Furdah, Mulloch, Kurredelli and Lascaroo, which latter place has a deep pool of water up among the rocks, the country becomes more forest-like. There are several small conical hills in this forest-land, and the rhinoceros seem to enjoy lying up for the heat of the day on the top of them. The dew is very heavy here, and the broad-cactus leaves hold half a tumbler of water every morning until the sun is well up. About 50 miles after having left Hergasia, on this westward route, ostriches may be seen and successfully stalked in some bush country, which extends on both sides of the track for a short day's march. They appear to be fond of feeding in this patch, but as a rule are on the open plains, and two miles is the nearest they will allow one to approach them, when they form single file and scud off with half-open wings and a rapid, waddling gait.

Certain tribes are unfriendly to other tribes. Each has its

allotted country, but sometimes a party will come beyond the proper boundary and loot camels and sheep, or the rice and dates of a caravan returning from the coast, which is bringing these articles in exchange for sheep skins, ghee, gold dust and ivory. At Hergasia, Mill Mill and Jiggigga, and one or two other places 50 to 100 miles apart, you will meet a permanent village, but the country is very sparsely populated with wandering tribes, who, when their flocks of camels and sheep, and perhaps a dozen oxen and ponies, have eaten down the herbage, "up stick" and move on, but they remain in their own area or district, and there is war to the death with some of the neighbouring tribes. Parties of one tribe are not averse to capturing men and women of a hostile tribe and holding them in ransom.

One day news was brought to my camp that the tribe of a native chief named Uskur, who was in Berbera at the time of my arrival, and who, at the Resident's request, offered to travel with us and show us his country, was encamped in the neighbourhood; three of their men had been captured by a hostile tribe, the ransom being two hundred head of sheep apiece. A few hours later further news arrived that six more men were captured, and that during the night presumably the same party had broken into the zareba occupied by Uskur's tribe and driven off some camels. One of the tribe, however, awoke, gave the alarm, and closed the breech in the thorn fence, when it was discovered that five of the marauders were inside, and after a scuffle, in which a woman was stabbed, they were captured. That afternoon—men having come to and fro with reports—Uskur asked leave for the night, to attend the ceremony of cutting the throats of the prisoners next morning. We did not interfere, as the Resident had told us not to, but only to report anything to him.

Each of these wandering tribes varies in numbers, but may consist of a hundred to three hundred souls. The men wear a loin cloth, the end of which is thrown over the shoulders if chilly, and by some tribes over the head; a rude hide belt and sheath with long knife round the waist; two spears, one a small one for throwing, the other a longer one, which is retained in the hand, and an oryx or rhinoceros hide shield on the left arm, about the size of a dinner plate. They all wear shoes, every growing thing having a thorn of some kind on it. I have described their hair, and a leather thong is worn round the neck, with a little square leather pocket, containing verses from the Koran. When sick the head is shaved, a woman applies a piece of hollow stick through which she sucks,

and the swelling so raised is incised. For pain about their joints or limbs a bit of red-hot stick from the fire is applied to five or six places around the painful spot. The women loop up the loin cloth over their breasts by a string over the shoulder, and wear a necklace of silver or blue and white balls. The married women tie up their hair in a piece of dark blue cloth; the maidens have long curls like the men, but much longer. The children often go naked. The tribe may possess over 1,000 camels and 4,000 fat-tailed sheep. The method of marriage is for the father to give his daughter to the highest bidder, 30 to 40 camels being about the price. The sum may be paid in yearly instalments, but after some have been paid the father may get a better offer, and if he takes it, as he probably would, there would be a quarrel and bloodshed between the two tribes. The money they get they rapidly convert into sheep and camels, and with each tribe there may be a dozen ponies and half-a-dozen oxen or cows. They do not camp near water, but some ten or fifteen miles off, and once or twice a week the women who make *hâns*, go to water and bring in sufficient for the community. The men drive their flocks on that day to drink also. A hollow is made in the sand, a sheep-skin pressed into it, and a man standing in the water-hole close by keeps filling, hours at a time, with a grass cup, as the flocks continue drinking and filing past. I noticed neither old men nor old women about, but could not get any satisfactory explanation as to the reason, and suspected that old people were quietly done away with, when they could not keep themselves and had become a burden to others.

One day when crossing a wide, dry river-bed, just before halting a few hours for breakfast, we noticed a track in the sand, as of something broad dragged along, and leading in the direction of two or three shallow water-holes. These may be any size, from that of a bucket or big barrel, to one of many feet. We followed the track and came up to a shallow hole, about two feet deep, in which lay, head first, the most horrible object of pity I have ever seen, namely, an old Somali woman, with positively skin only over her bony skeleton, and a small bit of tattered rag round her loins. In her hand she had a bit of tin pot, and she was drinking from the few inches of water which filtered through the sand, as fast as she scooped it up. She was not even strong enough to sit up, but told us she had been there two months, and had lived on the occasional handfuls of rice or dates passers-by gave her; and certainly not more than two or three caravans would pass her in a week. We told her we would tie her on a camel or donkey and take her to

Berbera, where there was a native hospital and native doctor from Bombay in charge, but she would not hear of it. She preferred to stay there, with the jackals and hyenas howling round her at night, and the latter probably galloping up and down past her, trying to snap a mouthful of flesh, after their manner. This habit of the hyena accounts for the frequent wounds I noticed in the hindquarters of the donkeys, and the habit these latter animals have at night, if approached from the rear, of kicking furiously. To return to the woman, however, we could not get out of her how she came there, but suspect she was left behind, either intentionally or unintentionally, by a caravan and lost. Snakes are rare, and I do not think I averaged seeing one more than once a month. In some places flies are most troublesome, and here it is that your mosquito curtains will "come in" at your afternoon siesta when in a standing camp.

My syce was rather amusing at times when he tried his English on. He certainly did know a very little. In trying to describe a female animal, he would say "wife oryx"; a fox was a "foxus"; a tree a "bush"; and the honey bird the "jam bird." One day our filters were attacked by a swarm of bees, and they absolutely would not touch the muddy water while a filtered drop remained available, but quite suddenly, towards evening, they all flew off, and thirty seconds after the first one made a move there was not one left. Another day a camel broke his leg in a hole, and my men fed for two days on it, never caring to draw their rice, and I noticed I had most excellent soup that week. Of birds there are quite a few suitable for the pot: three kinds of bustard, two kinds of guinea-fowl, one like a bantam hen, and the other a black and white speckled bird, with blue neck, and is very good eating. There are two kinds of partridge; also the hare. The big bustard supplies the most succulent "beef fillets." They would compare favourably with those of our best butchers at home. A complete set of the feathers of this bird, I am told, are worth £1 in the English market for making "flies." While on the subject of food, let me mention the young oryx as being the finest meat I have eaten; and I have sampled most animals, from the elephant downwards, also the musk deer and barking deer of the Himalayas, and these two latter are most excellent. There are some very handsome and curious birds to be met with, and I think they could be captured by the ordinary sieve and string: a few bird cages will accompany my kit on my next expedition there, together with a few large, savage, half-bred hounds for lion coursing. Ye Gods, what sport! but I mean to try

it and help them at it. One bird, I remember, is very like a magpie, and "baas" exactly like a sheep. The beak of this bird is often found on the person of a Somali native hunter, attached generally to his quiver of poisoned arrows. He will tell you it keeps off the eye of the "evil one." The honey bird, too, is a sprightly little fellow. Twittering away so persistently near to you that you begin to notice him, when he flies on to another tree, and kicks up such a row that you follow him to see what is the matter, when he goes to another tree, and so on, till he remains stationary on one, which, upon tapping with your axe, you will find to be hollow, and a quantity of most excellent honey in it. The hole in the tree has now to be enlarged if necessary, the bees smoked out, and the honey will then be obtained. It is well to eat sparingly of this at first and see the effect, as one case, at least, has been reported of the honey being apparently poisonous, but as a rule it is very good. Do not forget to throw birdie a piece.

On one grey cold morning I remember shivering with the greatest of great coats on over my very thinly-clad self, ready for the heat of the day; my tent was being struck preparatory to moving off on a twenty-mile march, when my cook handed me a steaming cup of what he said was cocoa. And cocoa the good man meant it to be. But I sniffed something different on raising the cup to my lips. He had only mistaken the curry powder for the cocoa tin in the dark of the early morning!

The country is of an open, undulating character, sparsely grown with grass about a foot high, and thinly dotted with small thorny trees and bushes, the thorns varying from strong, straight, thick ones, nine inches in length, to tiny strong-hooked ones, which were most trying to the temper. From the undulating plain one not unfrequently meets a high rocky ridge, running for two or three miles, or a conical hill, rising many feet from the plain. White tents, which can be more readily seen at a distance, should be used, for it is not a difficult thing to lose one's camp in that vast undulating country. It is also a good plan to carry a few rockets, so that your men in camp can send up one every half-hour after dark if you are not in, which you should be, as a lion, although a cur in the daytime, is very bold to stalk you after dark. You are seldom near any tribe's encampment, but occasionally one meets two or three men in the bushes, with a tame female ostrich, and a donkey dressed up like a female oryx, with the black and white head, skin and horns of the oryx fixed on to the donkey's head like a mask, and the oryx's tail lashed to the

donkey's. These men will crouch behind a bush near to their decoy, and when a wild ostrich or oryx comes up to see who the intruder is, they shoot him with their poisoned arrows, and after tracking for ten minutes find their quarry dead. They are very good shots too up to seventy or eighty yards, and hit my sun-hat three times out of four shots at this distance. One's hunters have a wholesome distrust of those fellows, and there is no doubt if they got a chance they would drive off a camel or pony, or put a poisoned arrow into one of your men if they found he belonged to a tribe they were at war with. The poison they use looks like cobbler's wax, wound around the barbed point of the arrow, and I believe it to be the aconite root, boiled down.

In a trip to this country a couple of hog spears might be included in one's impedimenta. For not unfrequently the wart hog is met in the open in the early morning, when a grand gallop might result. Better ponies can be hired from a wandering tribe than can be bought on the coast. They are very loth to part with a good pony, but do not mind hiring it to you, coming with it to look after it. There is a good deal of glare from the sun, and a pair of goggles is a very necessary article to take. Should you meet a wandering tribe, your men will probably ask you to buy them a fat-tailed sheep or two. This is all right, provided they only kill one at a time, for if you do not watch them they will also buy one or two and kill the lot, and gorge themselves with flesh, so that they are full of colic the next day and cannot march. They cook the meat by digging a long trench and filling it with dry twigs. They then spread a lot of green boughs across the trench from side to side, and on these they throw huge slabs of meat, and when partially cooked and frizzling well they eat it more or less raw. It certainly smells very smoky and good; but one has such a healthy appetite—covering rarely less than twenty miles a day—that one enjoys one's meals, no matter what they may be.

At Jiggigga, which it will be remembered is 207 miles inland, on the Abyssinian boundary, is a custom house officer, who rejoices in the name of the Fieffler. He takes toll of every caravan passing to and fro, and will come and pay his respects with a lot of armed niggers, with all sorts of old muskets and straw hats. He will present you with some hâns of milk and a fat-tailed sheep, and you in your turn will get a box out, cover it with a gaudy blanket and pray him to be seated, and motion his retinue to stand around him. You then present him with whisky and cigars and a tobe-bale of cloth, have a pow-wow, give him a bottle of whisky, and send him off. He will

send on the morrow to say he intended to call again but he is ill, and has finished that bottle of whisky and would like another. The next day another sort of Fieffler visited me from over the border. He was in command of over 1,000 soldiers, and brought a message from Ras Makounan for me to come to Harer and visit him. Ras Makounan, it will be remembered, was one of the important generals in the late war between the Italians and Abyssinians; he was lately much fêted in London, and I always regret I did not go. I had five days to spare. Well, forty miles meant two days' march for my camels, and one day there and two days back used up the whole time, and I wanted that five days after rhinoceros in the Jerer Valley close by. So I made my excuses. He sent word that he "wished to extend the hand of friendship to the English, the same as he had to Capt. Swayne Sahib."

Only once did I think I was in a tight place. A long way in the interior one night I was camped on the bank of a dry river-bed, and on the opposite side was a tribe unknown to my men. One of my men gathered, rightly or wrongly, that they meant to raid our camp during the night, and so I sent for the chief men to talk to them as well as I could. I knew Hindi, and I had Somalis who knew Hindi, Somali, and Abyssinian. The upshot was I thought I must impress them with my power as a medicine man and magician, but whether to do this with croton oil or tartar emetic, I did not know. Finally, I decided to try and impress them through their river-bed, which I found they worshipped. I placed seidlitz powder in a white pot, and a little kerosene oil in a bucket. I then told them what the setting sun had told me; that I mistrusted them and their protestations of friendship and help in my travels. They vowed I was their "father and their mother," and so on, and would do me no harm. But I thought it best to convince them, and I told them that I would burn up their river if any harm came to any of my camp, and they were dependent on the water-holes in it for water for many miles round. So I gravely told them I would ask them to fetch a little water and I would show them how I would make their river boil if I had any trouble. This was done. "See now," said I, with much juggling and incantation, "how I will make your river boil"; and of course, pouring the water into my cup with the seidlitz powder in it it all "boiled" over. "Still more," said I, waxing wroth and furious, and kicking over the bucket to my cook, who had been warned to catch it to save his shins, and see the kerosene did not upset. "Go! go!" said I, "draw me one cup of water in that bucket," and I flung the cup

after him. While he was gone, "Tell them," said I to my interpreter; "Quick, quick," I cried, "or it will be the worse for you"; and it was all repeated. And my nimble cook, who was of course "in the know," and who was, and had been, in an awful funk all day, quickly returned, having added no water to the oil. I exhibited the so-called water in the bucket, and standing back far from them for fear of the smell, I threw in a match, and of course it all lighted up, and said I, "I will likewise burn up your river," and it was all duly interpreted. They all called me a great priest; and my people gathered—all would be well—and so it was, for I noticed on the next day's march my men possessed many little things they had not had before, and I had a stewed chicken for dinner. I suppose they thought best to appease such a magician passing through their country.

The Somalis provide for the safety of the morals of their female children, whilst young, by subjecting them to an operation, the result of which is corrected by another operation the day before they are wedded.

At the end of your trip all your men look for a present of half to one month's pay, according to the time you have been in the country, and on your return to Berbera you have an auction of all that is left of your camels, ponies, &c., and quit the coast, when the weekly steamer arrives, for civilisation again.

GUNSHOT WOUNDS IMPLICATING THE LARGER JOINTS, ESPECIALLY THE KNEE AND SHOULDER.

BY CAPTAIN G. A. MOORE.
Royal Army Medical Corps.

BULLET wounds of long bones implicating the neighbouring joints are, perhaps, some of the most anxious cases one has to deal with on field service, and in which, at times, there must arise the greatest difficulty to decide what is best to be done in the interests of the patient.

The importance of the subject of gunshot wounds of the knee is great, when we read that of every 100 joints hit in war twenty-eight are those of the knee (Stevenson).

With the principles of conservative surgery, rigid antiseptic and aseptic precautions before one, the statistics of the results of even badly shattered joints have of late been revolutionised. Unfortunately these measures are not sufficient in every case, and we have left those where alarming constitutional symptoms have set in, or those, again, where, after careful examination, the injured surfaces are greater than can reasonably be expected to undergo repair by mere conservative methods, such as rest, drainage, judicious removal of sequestra, or foreign bodies. Perhaps, again, the case is one where damage has been done to the main vessels, or nerves of the limb, or the shaft has been badly shattered, and possibly the seat of another fracture lower down. In any of such cases one must fall back on the severe operation of amputation through the femur at a suitable level, a procedure which has been practised largely in the military surgery of all nations, though the statistics of its results are not pleasant reading, thus :—

In the Crimea the mortality after amputation through the femur was 55 per cent.	
In Italy	76 ..
In the war of 1870	95 ..
In the American Wars	55 ..

Occasionally one may have the good fortune to meet with cases which allow of an alternative to amputation being adopted.

In injuries of the knee, where, after thorough exploration, one finds that though the joint has been opened and the articular surfaces shattered, but not beyond an extent that would allow of their removal, and where at the same time the main vessels and nerves have escaped damage, and the patient's general condition

does not contra-indicate, then excision of the joint may be carried out, an operation of some difficulty and one requiring the greatest care and patience in the after-treatment, but surely a most rational one, and far preferable to the patient than one involving the loss of his limb. Unfortunately (in the opinion of the few advocates of excision) the bias of military surgical opinion has been, and still is, decidedly against excision in war in cases of knee-joint injury; its performance has been condemned by such men as the late Sir W. McCormac, who said: "Excision of the knee is unjustifiable in military practice in war"—a very strong statement surely. Ashurst says: "Excision of the knee should be banished from military surgery." Otis has written in the same strain. The objection of such men must be of much weight, but I cannot but think that the chief reason of their dislike for this operation was based on that which all students of military surgery have read of, and been taught as a dogma for years, viz., "that the patient may have to be moved after the operation," possibly a cogent reason for its non-performance in days gone by, but in our time of improved technique in the operation, of excellent transport arrangements, of ingenious splints and appliances for the fixing and proper apposition of the freshly-cut bone surfaces, this often quoted objection should be of much less weight. Possibly it is by reason of the acceptance of the verdict against the operation of excision of the knee-joint in war that I am unable to trace the record of a single case in our military surgical annals, though injuries must at times have occurred where its practicability existed. Have surgeons been deterred from undertaking excision of the knee after study of statistics such as the following:—

EXCISION OF THE KNEE-JOINT.

In the American War	...	...	...	Mortality	81 per cent.
" " Austro-Prussian War	...	...	...	"	86 "
" " Russo-Turkish	"	...	...	"	100 "

Terrible figures, but all occurring in wars where sepsis was rife, and sepsis of a knee-joint meant death or amputation (Stevenson). I attach the notes of a case of excision of the knee-joint for recent gunshot wound on active service, with a report on the patient's condition (five and a half years after the operation). On December 9th, 1897, at the British Field Hospital, Kohat, North-west Frontier, I operated on No. 4546 Private C., K.O.S.B., for destruction of the right knee-joint, the result of a wound from a large sporting bullet, received in action at Bagh on November 23rd. On admission,

after six days' unavoidable long and trying marches, over rough mountain passes, in a shaky dhoolie, the limb was found to be œdematous, extremely painful and powerless; evidences of sepsis were threatening, high temperature, sleeplessness and pain. The bullet had entered in the middle line 1 inch above the patella, and had passed down, inwards and backwards. The wound of entrance was small but gaping, and a narrow suppurating tract led down towards the bullet, which was afterwards found to be lodged in the internal condyle. For some days general treatment with washing out of the track was adopted, but the patient's condition becoming graver, and the pain agonising, I decided to operate, expecting to have to amputate through the knee-joint if possible, or failing that, through the lower third of the femur. Operation (chloroform anæsthesia): I passed a probe through the entrance wound 4 inches downwards and backwards, but could feel nothing loose in the track. I made two long incisions parallel to each other on either side of the entrance wound, and carried them down to a point on a level with the tubercle of the tibia, cutting through somewhat œdematous tissues. I then joined the lower ends of the two incisions by a transverse one. I raised the flap from below, and with it the patella, and exposed the joint. I found that the bullet had damaged the joint, and passing on had lodged deep in the internal condyle, which was much comminuted. The joint was distended with inflammatory and sanguineous fluid. The lower end of the femur was much splintered; the upper and inner articular surface of the tibia was damaged. I found that by a very free excision I could just remove all the shattered surfaces of the internal condyle, and of the upper part of the inner side of the tibia. This I did, removing about $2\frac{3}{4}$ inches of the femur, and $\frac{3}{4}$ inch of the tibia, after division of the lateral and crucial ligaments. The hæmorrhage was slight and easily arrested. The bullet, a large sporting one, was extracted.

I removed the patella, after providing for drainage at the four angles of the incisions. I closed the wound and put the limb up on a well-padded back splint, firmly bandaged, with slight elevation. I had no appliances, such as fixation needles, wires, pegs, or screws. The first few nights after the operation the patient's temperature ranged from 101° to 104° , then began to fall, and the pain, which had been agonising, became less. Four nights after the excision the tibial portion slipped backwards in the night, but under an anæsthetic I was luckily able to reset the parts, after which the position was well maintained. On December 20th I was ordered

up the Khyber Pass, and saw the patient no more. Six weeks later he was sent to Rawal Pindi, a long and very trying journey. After a tedious convalescence he arrived at Netley on April 21st, with firm fibrous union; he was then fitted with a special boot and invalided out of the Service.

July 12th, 1903 (five and a half years after operation).—Extracts from a report on this case kindly made by Captain Fleming, D.S.O., R.A.M.C., who traced the patient for me: "The operation of December, 1897, has been a complete success, there is a very strong, firm union. He never has any pain or weakness in the limb, and says he can walk about, or work all day in the pit. He walks best without any boot or artificial aid. The shortening is slight. There is a very slight inclination to inversion of the foot."

The conditions which led me to adopt this operation in preference to amputation were:—

Though under canvas and far from a fixed base hospital, or even railhead, we were in a well-fortified post where, as an exceptional case, I knew this patient could be kept for four to eight weeks. After thorough examination I found that removal of the shattered surfaces would just be possible by a free excision. The knowledge that if my excision failed (as it nearly did four nights after the operation—*vide* case), I could still fall back on amputation. The prayer of the patient, that while I should do to him what I thought best, yet if any chance at all existed, I was to leave him his leg and foot. Should such a case (where removal of the bullet and bone fragments, and general conservatism, seem unlikely to be sufficient) come under my care again under similar circumstances, I should, despite the bias of statistics, or text-book teaching against excision of the knee-joint in war, certainly adopt that procedure, and could only hope that the result might be as satisfactory to the patient and myself as this case has been.

EXCISION OF THE SHOULDER.

This operation has always been regarded with much favour by surgeons of all nations; Langenbeck, Stromeyer, Larry, spoke well of it abroad, and our own surgeons have been loud in its praise. Since the introduction of conservative methods of treatment, the many cases which formerly would have been considered suitable for excision have now become much fewer, but its place as an alternative to removal of the entire limb in certain cases is as valuable and established as ever. Among suitable cases for excision of the shoulder are: Cases where destruction of the head of the bone has

occurred, and where, in addition, the upper part of the shaft has been badly shattered. Cases where, in addition to the injury done to the head and upper part of the shaft, the bullet is firmly lodged and cannot be extracted. Cases where conservative efforts to save the head and upper part of the shaft have been unavailing, and the discharge is wearing out the patient. Cases where, in addition, sepsis is threatening.

The mortality after excision of the shoulder is about 29 per cent.

I attach the notes of one of the two cases of excision of the shoulder performed in the Indian Frontier (Tirah) Expedition of 1897-98.

Gunshot wounds of the shoulder form about 15 per cent. of all wounds of joints in war. The modes of treatment one is called on to adopt in these cases are conservatism, amputation, excision.

Conservative Measures.—The shoulder-joint and upper end of the humerus are among the most favourable situations for this line of treatment. In the statistics of the American War furnished by Otis, conservative treatment only failed to save life in 27 per cent. With the introduction of antiseptics and newer methods of operation, improved dressings, appliances, and transport arrangements, this mortality has since been still further reduced. The actual measures to be employed in this treatment cannot well be tabulated, but must vary with the symptoms presented by each individual case, and also depend on the experience gained by the operator in previous cases.

What are thoroughly necessary are: An accurate knowledge of the exact amount of the bone injured, and of its anatomical relations. Strictest asepsis in the operation. Judicious and timely removal of foreign bodies and loose fragments of bone. The provision of suitable drainage and rest by suitable appliances. Careful use of passive motion for the limb as the case improves.

Amputation of the Limb.—A short examination should show one the existence or otherwise of two of the main indications for amputation, viz., severe injury to the principal vessels or nerves of the limb. A large amount of destruction of the soft parts. The mortality after this operation is about 30 per cent.

Private J. N., Devonshire Regiment, was wounded at Mastura, Tirah, on October 29th, 1897, by a Martini-Henry bullet which had entered the front of the left shoulder, half an inch below the acromion. There was no wound of exit, and a probe could be passed $1\frac{1}{2}$ inches down and back, but no bullet could be felt. X-rays (used for the first time in British military surgery in this

campaign) showed a large lineal fissure on the upper surface of the head of the bone, but no bullet. The capsular ligament was ruptured, and I could pass my little finger nearly 2 inches into the head of the humerus. The main vascular and nervous supplies of the limb had escaped injury. Free drainage had been provided, and the wound had been carefully dressed on the long and unavoidable marches towards the base, but in spite of all care, abscesses had formed under pectoralis minor and in the axilla, and also behind the neck of the humerus.

On December 1st, at Kohat, as the patient's condition was not improving and he was suffering intense pain, I made a long incision from the wound of entrance down along the outer lip of the bicipital groove; I turned out the tendon, and everting the arm divided the subscapularis tendon. I then cut through the muscles attached to the great tuberosity, and opened the capsule. I then found that the head of the humerus had been extremely shattered by a Martini-Henry bullet, which was firmly embedded in it, and the upper 3 inches of the shaft and surgical neck were much splintered.

I excised below the splintered portion of the shaft, and enucleated the head of the bone. Arranging for drainage, I dressed the wound antiseptically, placed a pad in the axilla, and raised the elbow, bandaging the arm to the side. Passive motion was commenced after eight days, when the patient got up. Shortly afterwards he went down country, and reached Netley on April 21st, with "a useful arm and good movement."

This case was a most typical one for the performance of excision, primary or secondary. Primary was not feasible, wounded far up in the Afridi Maidan, separated from the nearest fixed hospital by many days of dusty and tedious stages in a shaky dhoolie; it was, doubtless, wiser to transfer the case unoperated on; the fact that the results of secondary excisions of the shoulder are rather more favourable than primary may also have had an influence in sending him down.

THE EXPANSION OF THE ROYAL ARMY MEDICAL CORPS IN TIME OF WAR.

By WILLIAM COATES.

Lieutenant-Colonel Commanding R.A.M.C. (Vols.), Manchester.

ON what lines the R.A.M.C. should expand in time of serious war in order to provide adequate succour for the wounded and sick, and what steps should be taken in time of peace to insure such ready and effective expansion, are questions which must, during the last few years, have occupied the thoughts of all who are interested in the welfare of the British soldier. It is at once manifest that it would be impracticable to maintain the R.A.M.C. during peace in sufficient strength to deal with the medical and surgical problems and requirements of an extensive and protracted war. Further, though we admire the manner in which the Army Medical Department during the South African War faced and provided for one of the most difficult, unexpected, and exacting campaigns in history, it appears none the less evident that the medical work was carried on as a result of superhuman efforts on the part of the Director-General and his Staff *during the progress of the war*, rather than in consequence of any prearranged, well-organised, and comprehensive scheme, the details of which had all been previously worked out, and conveyed to and thoroughly understood by those whose duty it would be to carry them out should necessity arise. It may be true that during the late war the R.A.M.C. did expand as occasion required. There was no lack of consulting, operating and civil surgeons, St. John and Volunteer Ambulance men, nurses and voluntary hospitals, &c., ready to go out, and who did go out when wanted. But this expansion was chiefly through the medium of organisations quite outside the R.A.M.C. It was not by any means a real expansion. On the contrary, in many instances, unless we are misinformed, it consisted in the employment of any material that came to hand with the remotest claim to ambulance knowledge; and the major part of this material was without any previous training in military ways. Helpers went out full of enthusiasm, well able, no doubt, to undertake the technical work for which they believed their services had been accepted; but, through want of previous special training in R.A.M.C. methods and work, and particularly because ignorant of army routine and discipline, much disappointment resulted to all

concerned. St. John Ambulance men, specially enlisted men and others, many of whom had never been inside a hospital ward, were rushed off to nurse the sick. The material may have been excellent, but through the absence of a good system the best possible use was not made of it.

No doubt now, profiting by experience, the most excellent scheme exists in the War Office for succouring the sick and wounded in future war; but it is to be hoped that long before this country is again engaged in serious war, the scheme may be made public—at any rate, that those who will be called upon to carry out any of its details may have the opportunity of thorough familiarity with it. If a plan is to succeed it must not only have the sympathy of the R.A.M.C., but it must be designed by the R.A.M.C., and carried out entirely by the R.A.M.C., or by its legitimate offsprings. There should be one system only, under one control, and this should be rigidly adhered to; but it should be the best that can possibly be conceived. If there was anything superior in any of the special hospitals that nobly volunteered during the war—if any lessons can be learnt from our own civil hospitals, or from the civil or military hospital arrangements of foreign nations, it is to be hoped that every advantage will be taken of them; but if success is to be achieved in war a definite scheme must be propounded: let it be the very best, but let it be clearly understood that this is the scheme of the R.A.M.C., and that it admits during war of no local or unauthorised alteration. It can only be a source of trouble in war when one hospital possesses advantages that do not exist in another, and it should surely never be heard that a soldier was able to receive benefits, say at the Yeomanry Hospital, that he could not also obtain at every stationary hospital on the line. This can only be accomplished by the adoption of a settled ambulance and hospital system for war by the R.A.M.C. It should be kept up to date, but it alone should be carried out during war.

However, it is not the elaboration of a perfect hospital and ambulance scheme for our army when at war, with most up-to-date equipment, &c., with which we are here concerned—although the subject is full of interest—but it is simply how best to provide an adequate and reliable *personnel*—one in absolute sympathy with and favourably recognised by the R.A.M.C.—with which to carry out the detailed work of such a scheme, when, in consequence of war, the majority of the R.A.M.C. are already employed.

After many years of experience, during which opportunities of studying the methods of the R.A.M.C. have been ample, and during

which association with the R.A.M.C. (Vols.) has been constant, the conviction becomes more and more fixed that the most natural means of expanding the R.A.M.C. in event of stress of war, the most sensible, efficient, and by far the most economical means, would be through the medium of the various divisions of the R.A.M.C. (Vols.).

It may at once be urged that these organisations *were* employed during the late war, and to a certain extent this is correct. Many members joined the R.A.M.C. under Army Order 58 of 1900, and Special Army Order dated March 11th, 1901, as specially enlisted officers, N.C.O.'s and men for the period of war, and others were employed in one or other of the Voluntary Civil Hospitals. In Manchester the R.A.M.C. (Vols.) was instrumental in one way or another in sending out to the war some 400 officers, N.C.O.'s and men, and in introducing a number of civil surgeons; and other divisions sent correspondingly large numbers. But certainly this assistance was not given or accepted as a part of a prearranged system, and certainly the volunteer units were not utilised to the best advantage.

So far as can be ascertained, no word of complaint has been heard by the Commanders of R.A.M.C. (Vols.) units concerning the aptitude for duty of the officers, N.C.O.'s and men sent out by them; but aware as we are, that many of these were despatched in a great hurry, and that after arrival in South Africa they were broken up and mixed indiscriminately amongst men drawn from other sources, the wonder is that they did so well. If, on the other hand, it is known by those qualified to judge that the R.A.M.C. (Vols.), when tried in South Africa was found "wanting," and thus is unequal to fulfil the requirements of this expansion (*and to a certain extent, as at present constituted, we are with them*), still, we would say, make them so, but do not condemn the system; rather let such steps be taken to remedy their defects as experience dictates to be necessary. They are the best material to hand, the cost to the country for maintaining them is trifling, all ranks are full of enthusiasm, and they possess intelligence and aptitude enough for the work; if they have failed, it is not their fault, but because they have not been considered seriously enough, because they have never known exactly what would be expected of them in war, and they certainly have never had the equipment or opportunities necessary to familiarise themselves with the duties which, during the war, they were called upon to perform. True, the original idea in connection with the R.A.M.C.

(Vols.) Divisions was for their employment in home defence alone; but it would obviously be a mistaken policy to detail the various divisions of the R.A.M.C. (Vols.) for service in this country only in time of war, and to expand the R.A.M.C. at the front by the only other apparently available means, viz., by the employment of specially enlisted officers and men, without previous military training, without *esprit de corps*, without the great advantages possessed by this associated volunteer organisation, which was ready to respond to her country's call before, and which may always be counted upon to do the same in any future national emergency. What is an extraordinary fact, is the widespread ignorance amongst members of the R.A.M.C. itself, not only of the establishment, training, and possible utility of this affiliated Volunteer medical service, but even of its existence. With the exception of the Headquarter Staff, the Principal Medical Officers of Districts in which units of this service exist, and a very limited number of regular Medical Officers, the R.A.M.C. (Vols.) is a mere name to the rest. For this reason a brief outline concerning the establishment, methods and *personnel* of the particular organisation which it is here claimed ought to be the natural means through which the R.A.M.C. should effectually expand during war, may not be out of place.

In eight large towns in England and Scotland, Companies, or, as they were formerly and better called, Divisions of the R.A.M.C. (Vols.) exist. In some instances there is one Company only, but in others there are four, five and six Companies. In addition, each Company has its own trained Transport Sections complete, and thus is independent of the Army Service Corps for horses and drivers. Some of these Companies form one Bearer Company, others form two Field Hospitals each.

A Company forming a Bearer Company has a *personnel* of four officers, and ninety-six N.C.O.'s and men, with a Transport Section of thirty-six N.C.O.'s and men. A Company forming two Field Hospitals has a *personnel* of ten Officers and ninety N.C.O.'s and men, with two Transport Sections of twenty-one N.C.O.'s and men each. It will thus be noted that in each case there is a surplus of men over and above the number required to comply with the regulations of the Army Medical Service. In Manchester four Bearer Companies and six Field Hospitals are formed, with Transport Sections for each; and the total establishment is 904.

The training through which the members of these Companies pass is as follows:—

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(a) Each member enrolls in the Corps for a period of four years ; many remain longer.

(b) During his first year a recruit must attend forty-five instructional classes, lectures and drills, in order to ensure the efficiency grant, but a longer course is usually voluntarily attended. Certainly, in case a member is dull and backward, he would be required to give a larger number of attendances. The training of recruits is carried out by an Adjutant and Sergeant-Instructors specially attached from the R.A.M.C. On the conclusion of the course a recruit is attached to one of the Companies, and the Company Commanders are responsible for Company efficiency. The recruits are trained, as far as possible, on the lines of the training given to recruits at the R.A.M.C. Depot, Aldershot. The training includes : (1) Squad and Company Drills ; (2) Stretcher, Hand-seat, Waggon and Cacolet Drills ; (3) Elementary Anatomy and Physiology ; (4) First Aid ; (5) Bearer Company and Field Hospital Exercises ; (6) Nursing Duties (by lecture and practical instruction at a Station Hospital when practicable). In Manchester, through the courtesy of the P.M.O., N.W.D., much valuable instruction is given to recruits at the Station Hospital.

(c) During the second, third, fourth and subsequent years each member must attend fifteen instructional classes or parades yearly. Many members attend a larger number, including occasional Field Days.

(d) In addition to the above, Camp Training for seven days is compulsory once in two years ; but each member generally attends camp every year, and a fair proportion remain in camp for fourteen days. The advantages of camp are :—

(1) It teaches men accustomed to a sedentary life to “rough it” and to adapt themselves to any circumstances.

(2) By association with regular troops and with the R.A.M.C. at Aldershot, Netley, and Salisbury Plain, an insight is obtained into military methods, habits and ways.

(3) It affords additional opportunity for learning lessons of discipline.

(4) It offers better facilities for practising Corps Drills, Bearer Company and Field Hospital Exercises, Field Kitchens, Tent-pitching, practical work in the field with troops, &c.

(5) Instruction can be given in practical nursing, and in administrative duties, in one of the large military hospitals, and also in the hospitals attached to brigade camps.

It is difficult to form a correct estimate of the average length

of service of these ambulance men. Four years is the term for which they enrol, and a penalty attaches to the few who retire before the completion of this period. Some remain twenty years and over; the majority of the N.C.O.'s remain ten to twelve years; and perhaps six years might be stated as the average length of service of the rank and file. The cost to the nation of this organisation is very small. It has been computed that £7 is the average annual cost to the country of each volunteer. But this is arrived at by massing all branches of the Volunteer Service together; and where rifle ranges, arms and ammunition have to be provided, the proportionate individual cost must be much greater than in the case of an ambulance volunteer. The outside annual cost to the nation per man in this branch of the Service will certainly be considerably under £5.

Such is a rough account of an organisation by means of which it is claimed that the R.A.M.C. could effectively expand in time of war. It has been in existence nearly thirty years; it is an offsprung of the R.A.M.C.; it is ready loyally to work under its orders; it is conducted on economical principles; its training, if insufficient, could be developed to almost any extent; it has shown its readiness and adaptability for employment in war, but it has *no recognised place* as a powerful instrument to be used with vigour and with judgment in war as an adjunct to the R.A.M.C. The Militia R.A.M.C. would, one presumes, be employed with their own Brigades, the Volunteer Brigade Bearer Companies would provide all necessary immediate aid for the Volunteer Brigades, and, in case of invasion, the civil hospitals would practically be at the service of the country. Hence, in time of war, not only would the several divisions of the R.A.M.C. (Vols.) be available for that expansion which, with very little foresight, they would be competent to supply, but, so far as one knows, no other particular position is assigned to them. Moreover, the material thus available would be of excellent quality and readily adaptable to the work that it would have to perform. Medical and other students of the various local universities and hospitals form a considerable proportion of the ranks of the R.A.M.C. (Vols). Many recruits are also drawn from warehouses, offices and shops, whereas a smaller number are artisans. Hence, there would be no difficulty in supplying each class of orderly required for duty in a R.A.M.C. hospital, both for nursing, clerical work and general duty.

With an organisation such as has been described, one built on the lines of, trained, so far as possible, in the same manner as, and

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yearly intimately associated with the R.A.M.C., containing a body of more or less intelligent men likely to make good orderlies of each class, pregnant with zeal and ready for employment in National emergency, and in some measure accustomed to army discipline and ways, it seems unnecessary to look farther afield for the provision of a *personnel* for the expansion of the R.A.M.C. in war. But in order to utilise in war these R.A.M.C. (Vols.) units as adjuncts to and for the expansion of the R.A.M.C., a comprehensive scheme should be worked out in peace, and each unit should know quite clearly what would be expected of it in war. What is wanted to insure success is first the establishment of the principle that the expansion of the R.A.M.C. in war must be done through the R.A.M.C. (Vols.), and second, the drafting out and promulgation of detailed and comprehensive regulations for the guidance of those who would be concerned in carrying them out. If this principle were adopted it would become necessary to insist that all concerned were well acquainted with the duties that would be expected of them on mobilisation. It would devolve on Inspecting Officers to ascertain, not only that a unit was adept at the various Corps drills and exercises, but that the scheme for war was thoroughly understood, and that those concerned were ready to put it into immediate execution. Each individual should know his part and duty in war, and each unit should, of necessity, camp for its annual training in the neighbourhood of the large military hospital which would be allotted to it in war, as suggested further on. No doubt others could improve upon any idea of expansion that can be suggested here, but if a scheme be worked out on some such lines as follows, a successful issue would be assured. It is based on the supposition that the regular R.A.M.C. will be maintained at a strength only enough to meet the requirement of peace and small wars, and that the Militia R.A.M.C. and the Volunteer Brigade Bearer Companies will be employed with their own brigades on mobilisation.

(1) NECESSARY AUGMENTATION OF THE PRESENT ESTABLISHMENT OF ROYAL ARMY MEDICAL CORPS (VOLS.).

In addition to the establishment shown in table of establishments and mentioned earlier, and which should be always maintained, each division of the R.A.M.C. (Vols.) should enrol the following details as supernumerary to the strength: (a) 350 qualified surgeons; (b) 35 qualified chemists; (c) 100 qualified sisters and nurses. This need entail no further cost to the country, nor should it necessitate any obligations upon the supernumeraries them-

selves, *except in event of mobilisation*. On mobilisation they should at once report themselves for training and duty at the headquarters of their respective volunteer units. No difficulty would be experienced in obtaining these supernumeraries, and a nominal roll would be maintained at divisional headquarters containing all particulars. This would be verified at the annual inspection. It is not proposed that the surgeons should receive a commission, except on mobilisation. A temporary commission would then be issued, and they would receive pay at Army rates. An allowance would also be given to them to cover the cost of a field kit. The majority of the surgeons on this roll would be recently qualified men not yet settled in practice, but holding public appointments. Before accepting any candidate careful enquiry would be made as to his suitability in every way for a commission. As most of the R.A.M.C. (Vols.) Divisions are located in university towns, where qualifications to practice are obtained, a plentiful supply of suitable men would always be forthcoming. This list (a) would also contain the names of men of special ability in different branches of the profession, such as operating surgeons, sanitary experts, fever specialists, X-ray operators, &c. Suitable men would always be patriotic enough to place their services at their country's disposal, and they would be satisfied to leave the question of extra remuneration to the decision of the "Compensation Board," presently to be alluded to. The surgeons on this list, and also the chemists, would, at the outbreak of the war, mobilise at the headquarters of their division, at which centre they would go through a course of preliminary training. The sisters and nurses would proceed for duty to the large military hospital whose *personnel* was supplied by their particular division, and as required they would accompany the various "medical units" sent out thence to the war (see further on).

(2) MOBILISATION OF DIVISIONS OF THE ROYAL ARMY MEDICAL CORPS (VOLS.).

For effective use mobilisation of volunteers must become something more than a mere phrase. It should not be left for volunteers to "volunteer" their services. Such a course deludes the public, and prejudices the volunteer in the eyes of certain unpatriotic employers. Rather energetic steps should be taken to educate all classes to the danger that lies in living in a false sense of security, to their own individual responsibility in maintaining the integrity and supremacy of the nation, and to the great financial economy that accrues to both the nation and the individual in the employ-

ment of a volunteer as compared with a conscriptive service. At present, even in peace, many employers of labour decline to allow their men to belong to any branch of the Volunteer Service, but surely some means could be devised to convince them of the advantages and economy of a voluntary service to themselves; and if not, legislation should step in and pass such laws as would suffice to protect the volunteer from permanent loss of his position as a consequence of the mobilisation of his unit. However, mobilisation of volunteers must become a reality, so that in national emergency volunteer units can be called out as required, and it should never again be left to men themselves to volunteer, as this course would undoubtedly compromise their future.

(3) The mobilisation of the Volunteer R.A.M.C. divisions would liberate the R.A.M.C. itself, so that it would be free to mobilise for war with the first field army.

(4) On mobilisation each unit of the R.A.M.C. (Vols.) would assemble at its own headquarters, and it would supply the medical details required for the various military hospitals, &c., in its own district.

(5) In the case of the stronger units of the R.A.M.C. (Vols.) the surplus members should supply the *personnel* of one or other of the great military hospitals, such as Netley, Cambridge, Connaught, Woolwich, &c. This course would give the opportunity to both Officers, N.C.O.'s and men of the R.A.M.C. (Vols.) of acquiring that practical knowledge of the administrative and detail work of military hospitals, which it is essential they should be familiar with before employment on active service in the field.

(6) In the large military hospitals, and at the headquarters of the chief military districts, in order to insure continuity and exact military methods, the Principal Medical Officer, with two regular Medical Officers and two or three Sergeants, should be retained from the regular R.A.M.C. If it is thought that the R.A.M.C. (Vols.) would be unequal alone to the task here assigned to it, a larger number of regular Officers and N.C.O.'s should be attached temporarily to the various units.

(7) Each divisional headquarters of the R.A.M.C. (Vols.) should, on their mobilisation, at once become a *dépôt* for enlisting and training men for service in the R.A.M.C. *during the period of the war*, and for training the surgeons, chemists, &c., mentioned in paragraph (1), prior to their being drafted to the military hospitals, *en route*, if required, for the war. An unlimited supply of candidates could be assured. The staff at these *dépôts* would consist of the

Officer Commanding, the second in command, the Adjutant, and Sergeant-Instructors of the Division.

(8) As required for the war, the *personnel* of Bearer Companies, Field Hospitals, Stationary Hospitals, General Hospitals, &c., would be available from the volunteers carrying on the work at the various military hospitals, and as vacancies occurred in the district, and at the hospitals, through the despatch of these units to the war, recruits would be supplied to fill them from the Depôts R.A.M.C. (Vols.).

(9) "Pay" of all ranks on mobilisation should be at Army rates, and no inducements of extra pay over and above that given to the corresponding rank in the Army should be offered under any circumstances. At the conclusion of the war, however, a "Compensation Board" (nominated by the Government yearly, and composed of well-known business as well as Army and other professional men) should consider all claims of volunteers employed during the war, and in cases where great loss has been sustained through service, the Board should have power to recommend adequate compensation. This would prevent much heart-burning, both on the part of the volunteer and the regular soldier.

(10) The regular Depôt, R.A.M.C. at Aldershot would continue its own work, viz., the training of men who enlist for ordinary service in the Corps, quite apart from the war.

Perhaps the plan thus roughly sketched might be further elucidated if it be supposed that a great war is imminent, that a large field force has been mobilised for service, that the R.A.M.C. in this country has been ordered to mobilise with this force, and as a consequence, the various divisions of the R.A.M.C. (Vols.) have also been ordered to mobilise.

Manchester might be taken as an illustration. The whole of the R.A.M.C. doing duty in the North-Western District, with the exception of the Principal Medical Officer, and say, four Officers and six Sergeants, having mobilised for field service, the task of replacing them would devolve upon the Manchester Companies of the R.A.M.C. (Vols.), which would already have mobilised in Manchester. The strength of the Manchester Companies is over 904, but of this number 64 would be required to form a Bearer Company for the 29th Brigade of the field army, and 240 would be transport men; hence 600 men, including 41 Officers, would be immediately available for hospital work. The number of Officers could, if necessary, be largely augmented at once by drawing upon the 350 qualified surgeons whose names would have been registered for service in time of war.

Amongst this number would be a certain percentage of retired officers with previous experience in the Corps, who would, in case of urgency, be utilised before passing through the preliminary head-quarter training.

Thus from Manchester the *personnel* of the various station hospitals in the North-Western District would be supplied at once, one or, at the outside two, companies sufficing for this duty. The remaining Manchester Companies would be available to supply the *personnel* of whichever of the great military hospitals had been allotted to this division. Let it be, for illustration, Netley, where, with the exception of the Principal Medical Officer, and say two Officers and four Sergeants, the Manchester Division, R.A.M.C. (Vols.) would supply the details.

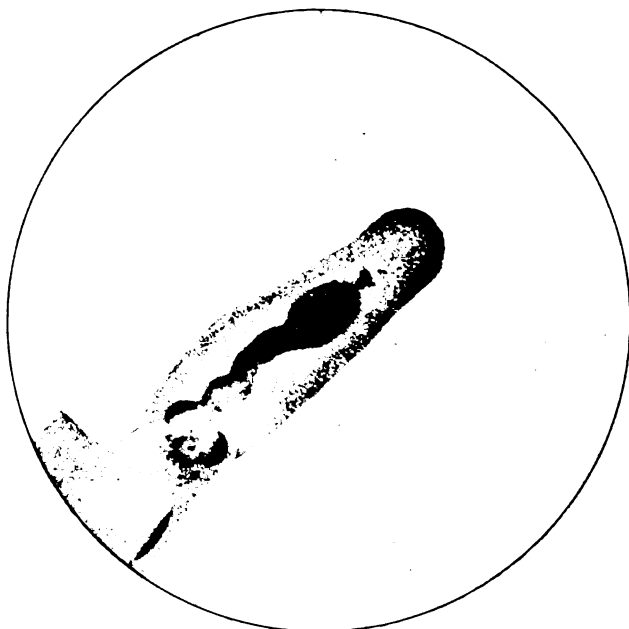
At first the work might be difficult and laborious to those unaccustomed to it, and the machine might not work for a week or two quite smoothly, but zeal and enthusiasm would make up for lack of experience, and in a short time it may be assumed that no P.M.O. would wish a more worthy subordinate staff. It will be noted that both at Netley and at the various stations of the North-Western District a larger number of men would be available than it is usual to employ. This would provide for the adequate nursing of any number of sick and wounded returned home from the war, and it would enable "units for the war" (Bearer Companies, Field Hospitals, General Hospitals, &c.), to be prepared with discrimination, without hurry, and to the best advantage. In the meantime a *dépôt* would have been formed at the Manchester headquarters of the R.A.M.C. (Vols.), at which the staff would remain. Here the medical officers on the Corps Register, joining for special and ordinary service during war only, would go through a short course of training, and recruits would be enlisted for the period of the war, and trained more or less as at the Aldershot *Dépôt* now. After a month or six weeks' training here they would be drafted for further training to Netley, or to one of the Military Hospitals in the North-Western District.

There would be no difficulty in getting suitable men; this can be assured from the experience of this Corps during the South African War. Time-expired members of the Corps, many of them N.C.O.'s (every year some 200 members, after the completion of their four years' training, take their discharge, hence there would be amongst the hundreds of such-like men in Manchester many anxious to rejoin), members who have formerly belonged to Volunteer Stretcher Bearer Sections, members of the St. John Ambulance

Brigade, and other useful men, would come forward in large numbers. Ample accommodation could be provided for them at the local headquarters, and they would be under Army conditions so far as rations, clothing, discipline, &c., were concerned. These men would be trained on sound lines, and they would be ready, when required, to be drafted to Netley to complete their nursing training and to replace the "units" leaving for the war, whence they themselves would be despatched as occasion required. Under this scheme, although the greater part of the R.A.M.C. would be occupied with the first field force, the control, both at home and at the war, would remain absolutely in the hands of the Army Medical Department, and the important posts would be held by R.A.M.C. Officers. As the war progressed, and as fresh troops went out, the medical details would be supplied by one or other of the volunteer units, which, in the meantime, would have been doing duty at the military hospitals in the different military districts. In this manner at least 100 N.C.O.'s and men, properly trained, and an abundance of Officers could be sent out, if necessary, each week in rotation from the various divisions of the R.A.M.C. (Vols.). One week it would be from the "Manchester Division," another week from "Glasgow," another week from "London," "Woolwich," and so on. That these men would volunteer for service under such conditions *en masse* anywhere is absolutely certain, and however many more were required than 100 weekly they would be ready, and they would be properly trained. In order to promote *esprit de corps* and to obtain the best possible work, the volunteer units should be kept together in separate medical field units, and they should never be "shifted" about indiscriminately, as was the case in the Boer War. If doubt should exist of their ability for the duties, then a Sergeant-Major from the R.A.M.C. should be attached to each unit.

The above is the basis of a workable scheme so far as expansion in numbers is concerned. There is nothing revolutionary about it. It is simply the practical employment, elaboration and development of an already existing organisation, one framed and trained on R.A.M.C. lines, for the express purpose of strengthening and supporting the R.A.M.C. in time of war. The financial saving to the country of such a scheme, as compared with any attempt to increase the R.A.M.C. establishment to a strength enough to cope with a large war, would be enormous; not only so, but there would be good value for a very small outlay. It would be impossible in the future to "rush" doctors, ambulance men and nurses to the

seat of war without previous proper training and investigation, without any knowledge of Army ways and discipline, and in the case of Officers, without any rank. The "civil surgeon" would cease to exist as such, and not only would it be impossible for a man without good credentials to be sent out, but amongst the number would be many of the best men in the profession. Each medical officer would receive military training before he was sent out to the war, each would possess a temporary commission in the Army, and each would be entitled to the respect and privileges attaching to a commission. At the same time, each would be subject to the discipline and regulations of the Army. The members sent out by one division would always be kept together in the unit which they formed, and they would be under their own Officers and N.C.O.'s. This would create an enthusiasm, a rivalry, an *esprit de corps*, which at all times contribute so largely to the execution of first-class work. The adoption of this scheme would relieve the Medical Department of the War Office of a large amount of detail work, and so promote a more thorough supervision of the whole. It would do away with the necessity for special hospitals, each with their own ideas of organisation and detail, which must be the source of much friction. The work of the special hospitals in the late war (Yeomanry, Welsh, Irish, Scottish, Portland, &c.), was most excellent, and it is difficult to see how the sick would have fared without them, but such ought not to be necessary if a comprehensive scheme were thought out, developed and insisted upon.



Head of *Bilharzia haematobia*. $\times 15$.



Bilharzia haematobia. Female in gynæcophoric canal of male.
 $\times 15$.

To illustrate note by Lieutenant-Colonel BIRT, R.A.M.C.

Clinical Notes.

BILHARZIA HÆMATOBIA.

BY LIEUTENANT-COLONEL C. BIRT.
Royal Army Medical Corps.

WE are all familiar with that woodcut of the female bilharzia in the gynæcophoric canal of the male, after Leuckart, copied from one book to another. It has done duty for so many generations of medical students that suspicions have been almost aroused whether a specimen such as that figured would ever be again seen. Goebel, however, in *Arch. f. Schiffs. u. Tropenhyg.*, No. 3, 1903, abstracted into the *Cent. f. Bakt. Ref.*, November 4th, 1903, states that all the worms he has found in the bladder or rectum, *post mortem* or at operation, have been thus associated.

Occasions on which it is possible to examine the viscera of those who have served as hosts to this trematode are extremely rare in all parts of the world except Egypt. As part of the routine of necropsies conducted in South Africa I have searched the bladder for bilharzia papillomata, until recently without success. A short time ago a Kaffir was brought to hospital unconscious and delirious. He survived a few hours only. It was found that he had but lately been convalescent from enteric fever, and that he had succumbed to acute bacillary dysentery. The bladder was open *in situ*, and on the discovery of papillomata, the whole viscus, with the rectum, was carefully removed and dissected under water. On dividing the prostatic plexus of veins some bodies which proved to be adult bilharzia floated away. Some half a dozen specimens were recovered, though there were probably many more lost in the *débris* and blood-stained water. They were all single with the exception of the pair in the accompanying photograph. In the interior of the bladder were large, somewhat raised, brownish patches covered with a gritty deposit, which was not easily removable; indeed, the surface resembled fine sand-paper. Scrapings showed that the roughness was due to ova. On the posterior wall were also two papillomata. These were excrescences of about the size of the end of the little finger, of great vascularity and soft consistency. They were stalked, with flattened faces.

Although the inspection of the body was made within twelve hours of death, there were no signs of life either in the mature worms or their ova. No embryos could be hatched from the latter, which in my experience is quite unusual. This raises the question whether the typhoid or dysentery toxins had not exercised some baneful influence on the parasites. It is a well-known fact, of which I myself have seen three instances, that round-worms are almost invariably dead if found in

the alimentary canal of those who die of enteric fever. Demateis, in the *Cent. f. Bakt.*, Band xi., No. 21, has reported twenty-seven cases which were freed from these pests by acute infections, chiefly enteric fever and pneumonia. It therefore seems probable that anti-typhoid vaccination, or perhaps inoculations with killed cultures of many other pathogenic organisms, might have some curative effect in such a notoriously intractable disease as bilharzia. Unfortunately I have not had an opportunity of testing this method of treatment.

NOTES OF AN UNUSUAL CASE OF SNAKE-BITE.

BY CAPTAIN F. G. FITZGERALD.

Royal Army Medical Corps.

THE following notes on a case of the above may prove of some interest:—

Alfred M., aged 10, was bitten on the left forearm by a *Tic-polonga* snake, length 2 feet 6 inches, on the evening of August 25th. I happened to be in the Station Hospital at the time and saw the boy about one minute after he had been bitten. The bite was immediately excised and 20 minims of liq. calcis chlorinata injected round the wound in separate places, which was then dressed with strong carbolic lotion; 3 grains of calomel was given, and brandy at intervals.

The same night the boy became delirious; temperature 102°; violent vomiting and purging; the arm became greatly swollen, and extremely painful, as far as the axilla. He remained in a very precarious condition for a week, when all symptoms gradually subsided, and he was out walking about after twelve days.

The patient remained in good health till September 25th, when a large abscess formed at the seat of the bite, which had to be opened and drained, and he was discharged from the sick list on October 14th. On November 16th I was sent for to see the child, who was complaining of a severe pain over the spine, the point of greatest intensity being over the seventh cervical vertebra, and extending down to the lumbar region. Temperature 100°. He was also complaining of not being able to open his mouth, and of sore throat. On proceeding to examine his throat I found that he was only able with great difficulty to open his mouth wide enough to enable me to admit my little finger. The face and eyelids were greatly swollen, so that the boy could hardly see. He was suffering great pain from his back, which was of a spasmodic nature. The urine contained traces of albumen, and was greatly diminished in quantity. Both knee reflexes were greatly exaggerated, and all the muscles in a state of a rigidity, the abdomen feeling like a board to the touch. When he tried to walk his legs remained quite stiff, and he appeared to swing

his body round from his hips when walking. When lying down he complained of shooting pains down both legs.

I ordered him three grains of calomel, and a mixture containing: Chloral hydrate, ten grains; tinct. cannabis indica, ten minims; aqua ad., one ounce. Dose, one ounce three times a day, and keeping his bowels regular with small doses of calomel.

The patient remained in this condition for three weeks, when he gradually got better. At the present time the child is almost well, except for one feature which has been present all along, viz., that his manner has quite altered; he is very bad-tempered, although he laughs at almost everything that is said to him, and has a peculiar silly-looking expression. In every other respect he is in good health.

The bite of the *Tic-polonga* is always regarded as fatal in a very short time, and this was an average sized one, being 2 feet 6 inches long.

ON THE TREATMENT OF ERYSIPELAS OF THE SCALP AND FACE.

By MAJOR C. H. HALE.
Royal Army Medical Corps.

In opening these few lines on the treatment of the above complaint, I would state that in my opinion carbolic acid is not resorted to frequently enough in the treatment of infective inflammations, such as erysipelas, lymphangitis, &c.

Bacteriology has advanced by leaps and bounds of late years, and yet I have frequently seen the old treatment of dusting powder of starch and zinc, or starch alone, adopted up to quite recently; and, again, in many modern works on surgery no local treatment beyond the above is recommended. Erysipelas, even in its so-called idiopathic form, is due to the introduction of a streptococcus through some wound, however minute.

It is always to be regarded as a dangerous disease about the face and scalp, owing to the possibility of its spreading to the intracranial tissues through one of the communications existing between the external veins and the cavernous, superior longitudinal or lateral sinuses; in broken-down constitutions this may be very rapidly accomplished, often being only a question of a few hours, and thus leads to an early fatal result. Probably most medical men who have had any length of experience in workhouse infirmaries can easily recall such a case. It therefore behoves us to do something more locally than merely cover up the affected area with dusting powders or cotton-wool; we must vigorously attack the streptococci, and not leave the condition of the patient to fight the germs, aided only by the internal administration of iron and other drugs.

The chief indications, locally, in treating such a case are to reduce the pain and swelling; but since these symptoms are due to the presence of streptococci in the tissues, it resolves itself into attacking these microbes. For many years I have used the following with the most successful results:—

Take pulvis cretæ aromaticus cum opio and mix thoroughly with glycerine until a mixture of the consistence of treacle has been obtained, then measure the quantity and add liquefied carbolic acid, so that there shall be one part of liquid acid to every ten parts of the mixture; the preparation should now be carefully rubbed up until thoroughly mixed, and then painted over the affected area with a camel-hair brush. After about ten minutes, lightly cover over the painted area with a single layer of lint.

The result of such application is threefold: firstly, pain very soon disappears; secondly, the swelling soon subsides, and a fair amount of water often exudes through the application, much as ordinary perspiration oozes through theatrical paint or grease; and thirdly, the part is absolutely protected from contact with the air. But another result follows which is of the greatest importance, and which shows that the progress and vitality of the streptococci are being successfully attacked, and that is reduction of the fever. I have often reduced the temperature from about 105° F. to normal in twenty-four hours, and rarely have I seen it higher than 99° F. after forty-eight hours. The old application should be washed off the face or shaved scalp in twelve hours or so, and reapplied in the same way. Perchloride of iron, either alone or combined with mag. sulph., should be given throughout.

I cannot say if it is the acid or the opium which relieves the pain, but certain it is that the application gives most rapid relief, and often before the affected part has been fully painted the patient will make such a remark as, "Oh! how beautifully cool and soothing."

Had I the notes of all my cases so treated at hand it would be tedious to relate them; I will, however, conclude by relating the following case and its amusing dialogue from memory:—

A few years ago I was called by a colleague in consultation over a case of erysipelas of the greater part of the scalp; there were several areas of bogginess, and the temperature was somewhere about 105° F., and the pulse rapid. The patient was a strong, healthy man, and beyond complaining of pain, I cannot recall any special symptoms. My colleague suggested free incisions over the boggy areas; I did not agree, and at once I suggested the above treatment. He replied, "But, my dear fellow, if you could see them, you would find millions of streptococci right down to the aponeurosis, and even beneath this, possibly; how are you going to get at them?" My answer was, "I do not care how many streptococci there are; I am not suggesting experimenting on the case; I recommend it because practical experience has taught me that it is the proper

treatment, and I know that it will kill all the streptococci far better than your knife will, and I feel sure I can thereby reduce the temperature to normal in forty-eight hours." He gave in, and agreed to "try" the treatment. I can well remember that next day the temperature was practically normal, and the patient convalescent. Well may we say with Dr. P. W. Latham, "While you struggle to be scientific do not forget to be practical" (*British Medical Journal*, p. 892, October 5th, 1901).

TWO CASES OF BILHARZIA HÆMATOBIA.

BY CAPTAIN P. S. LELEAN.
Royal Army Medical Corps.

CASE 1.—Sergeant F. Emery, 2nd Lincolnshire Volunteers, was invalided from Reifontein in the Rustenberg district of the Transvaal, and was admitted to Cambridge Hospital, Aldershot, February 20th, 1902.

He gave the history of having suffered continuously for months from the passage of blood with his urine, this condition having commenced four months after his having entered the Rustenberg district. On admission micturition was said to be frequent and painful—blood flowed with and after the last ounce of urine, the initial stream being perfectly clear, and the blood lost on each occasion being estimated at 2 drachms.

The urinary sediment, obtained by centrifuging, when placed under the low objective was found to contain numerous ova of bilharzia, the ova lying in a thick deposit of xanthocytes, leucocytes and triple phosphate crystals. Under higher powers it was seen that the advanced development of most of the ova afforded unusual opportunities for studying the water-vascular system of the contained embryo, and under the oil immersion lens the following features were demonstrable:—

The contractile bodies, four in number, were arranged in pairs opposite the coronal apertures, and pulsated synchronously at the rate of 240 beats per minute. Seen transversely they were 7 microns in diameter, with thick, well-defined walls, and filled with a circulating fluid containing highly refractile particles. Seen longitudinally they were short tubes containing in their lumen a dark flame-shaped object with three curves undulating from base to apex synchronously with the pulse. The anterior contractile bodies were directed upwards and backwards, they were traceable by careful focussing to within a short distance of each other dorsally, eventually being lost among the sarcous granules in which they were embedded. The posterior pair, more transversely placed, were also traceable towards each other, to be lost sight of before reaching the mid-line. No lateral anastomoses were apparent, nor any communication with the coronal apertures.

Intraovarian embryonic movements were most vigorous, they increased

on diluting urine, and after fifteen minutes' incubation at 20° C. many were found hatched and free-swimming, leaving their longitudinally burst shells.

The number of empty shells in freshly passed urine suggested an error in the generally accepted view that hatching did not occur in the bladder, but only when urine has been diluted after evacuation. This apparently only holds good for alkaline urine, as observation subsequently demonstrated hatching of embryos in faintly acid and neutral urines freshly passed, diluted and maintained at 37° C. There is thus little doubt that this process is in constant operation in the human bladder, and interesting light is thrown upon the question of auto-infection. I am now incubating ova in blood serum at 37° C. in hope of obtaining further evidence.

Treatment was directed first to neutralisation of the urinary alkalinity, which was effected by the exhibition of benzoic acid, gr. xv., t.d.s., tinct. belladonnæ being added, and in two days the urine was faintly acid and the frequency of micturition less, the blood remaining constant.

The success of benzoic acid was attributable to :—

- (1) Lessening of reflex vesical irritability.
- (2) The fact that almost the total amount given *per oram* passes as hippuric, combining with the ammonia present in the urine in conditions of alkaline cystitis.
- (3) The acidity caused by large doses having been proved experimentally to retard hatching of embryos.

Methylene blue was next exhibited and the following results observed :—

- (1) Colouration of urine within fifteen minutes of administration.
- (2) Increased vesical irritability for twenty-four hours.
- (3) Diminution of hæmaturia, blood being less in ten to twelve hours, reaching a minimum in thirty hours, and the result of one day's administration being maintained for from five to seven days.
- (4) No better result was obtained from continuing methylene blue than by suspending it after one day until the amount of blood began again to increase.
- (5) Tinct. hyoscyami combined with methylene blue checked the increase of vesical irritability caused by the latter.
- (6) There was no characteristic three-banded spectrum in the blood indicating the formation of methæmoglobin which has been stated to occur in patients after administration of methylene blue.

The treatment was adopted as follows : Every sixth day methylene blue, gr. iv., c̄ tinct. hyoscyami, m30, t.d.s., and meanwhile benzoic acid gr. xv., t.d.s.

The results of this treatment were symptomatically most satisfactory. Hæmaturia in two weeks practically ceased for the first time for several months, and did not reappear. Ova were always to be found, but the

numbers seemed to be steadily diminishing when the patient asked for his discharge on urgent private affairs, March 22nd, 1902.

CASE 2.—Private Joseph Cole, 2nd Lincolnshire Regiment, was invalided from South Africa with a diagnosis of bilharzia contracted in the Transvaal, and admitted to the Cambridge Hospital, Aldershot, February 20th, 1902.

The disease commenced four months after patient entered the Rustenberg district. Hæmaturia was the initial sign—a few drops of blood following the urine, the amount increasing steadily until dysuria appeared a week later. Those two conditions increased *pari passu* until micturition occurred every half-hour and the blood amounted to 1 drachm after each passage. Subsequently dysuria subsided, but the blood remained constantly present, although showing a diurnal diminution between the hours of 10 a.m. and 2 p.m. On admission patient was anæmic and depressed by the chronicity of his disease.

Effect of reagents on embryo when hatched were as follows: HCl, .05 per cent. solution (one-quarter acidity of gastric juice), run under the slide killed free-swimming embryo in thirty seconds; KHO, .05 per cent. solution, killed in one minute; methylene blue aq. solution, diluted, killed in from two to five minutes; benzoic acid, .1 per cent. solution, killed in ten to fifteen minutes; in all cases retraction of head occurring before embryo assumed circular lethal form.

Regarding the action of methylene blue, I am of opinion, after prolonged observation, that it exercises an inhibitive intracystic action upon the development of young ova, but has no power to arrest the hatching of fully developed embryos, although rapidly fatal to them when hatched.

When a loop of fowl's gut containing an aqueous solution of methylene blue was suspended in a tube containing diluted urine from this patient it was found that the dye passed the membrane speedily and was absorbed by the ova, the contained embryos showing no decrease of active movement—hatching as usual, dying in less than fifteen minutes, and discharging the blue after death.

Some ova from this patient I incubated in blood serum at 30° C. for twenty-four hours, watching the effect at constant intervals, and after seeing many embryos in active movement, I was at length rewarded on the second day by observing one force its escape from the shell and swim freely in the surrounding serum, thus disproving the theory that bilharzia embryos cannot hatch or live in blood.

Treatment.—A short course of iron and arsenic, in conjunction with a full dietary, dealt with the anæmia, and patient was then placed upon the routine treatment of methylene blue, gr. iv., t.d.s., every sixth day, with benzoic acid during the five-day intervals. The result was most marked; after two doses of methylene blue hæmaturia was much less, and after the third almost disappeared, eventually wholly disappearing

after the second day's administration, subsequently to which it did not return.

The ova were always demonstrable in the urine, and other drugs exhibited in hope of inhibiting their development were ext. suprarenalis, urotropine, glycerine acidi carbolici (in full doses), ol. terebinthinæ, ext. filicis mas, but none had any appreciable results in the time available.

When treatment was suspended the hæmaturia showed a tendency to rapidly return, and markedly so after any undue exertion or fatigue. Patient was discharged at his own request, June 2nd, 1902, being then free from hæmaturia and dysuria, anæmia having been combated and the microscope furnishing the sole evidence of the continuance of his disease.



Echoes from the Past.

THE ARMY SURGEON, AND THE CARE OF THE SICK AND WOUNDED DURING THE GREAT CIVIL WAR.

BY CAPTAIN H. A. L. HOWELL,
Royal Army Medical Corps.

PART II.

EACH of the Physician-Generals in the Parliamentary Army received 10s. a day pay, and each Apothecary-General 6s. 8d. The pay of the medical officers of the Parliamentary Army varied at different times during the war. Physicians were always better paid than surgeons, and the pay of the apothecary was sometimes greater than that of the physician, but usually less, and always more than that of the surgeon. According to a pay-list in "Barriffe's Military Discipline" (quoted by Fortescue), there were on the staff of the Officers General of the Train :—

					£	s.	d.	
A General's Physician	...	...	...	pay	0	6	8	a day.
1 Army Physician	...	...	...	..	0	6	8	..
1 Apothecary	...	...	...	..	0	10	0	..
1 Chirurgeon	...	...	...	..	0	4	0	..
2 Mates	...	...	...	..	0	2	6	..

And, on the staff of the Horse Officers of the Field :—

					£	s.	d.	
1 Chirurgeon	...	...	...	pay	0	4	0	a day.
2 Mates	...	...	...	..	0	2	6	..

In 1657, however, the apothecary to the headquarter staff of the Flanders Expedition received only 4s. 4s. a day. Until 1651 the surgeon's pay was 4s. a day, and he had two mates at 2s. 6d. a day. His pay was now increased to 6s. a day, but an entry in the "Calendar of State Papers, Domestic," dated February 10th, 1652, reads "For salaries of 7 surgeons at 4s. a day and 12 mates at 2s. 6d. a day, dressing the Scotch prisoners' wounds and expense of medicaments £228"; thus showing that, on occasion, surgeons were still engaged at 4s. a day. These may, however, have been surgeons specially and temporarily engaged. In 1655 the surgeon's pay fell to 5s. a day, and one of his mates was taken from him. In 1657 the army surgeon found his pay again reduced to 4s. a day. According to a list of the Army establishment on February 27th, 1659 (Harleian

MSS. 6844, quoted by Grose in his "Military Antiquities"), the pay of the surgeon to the Commander-in-Chief and his mates was 8s. a day. The surgeon to a regiment of horse received 4s. a day, "and one horse to carry his chest, 2s." Each regiment of horse numbered 480 men. The surgeon to a regiment of foot ("1,200 souldiers") had, as pay, 4s. a day, and his one mate 2s. 6d. a day.

The rates of pay as received by surgeons in our Army in 1659, during the Protectorate of Cromwell, remained unaltered during the four following reigns; we find, in fact, little increase in the surgeon's emoluments for over a hundred years. According to Gardiner, the value of money was at this period from three to four times as great as it is at the present day, so that the pay of a surgeon in Cromwell's Army would in modern money be equivalent to something between 12s. and 16s. a day. The medical profession, however, was not at that date overstocked; most surgeons served an apprenticeship of seven years before they practised for themselves, and it is probable that the skilled surgeon was able to earn a great deal more in private practice than he could as an Army surgeon. The pay offered to the Army surgeon was too small to induce many skilled surgeons to join the Army, for records exist which show that the Army contained many very incompetent surgeons. There is, in the Thurloe Papers, a petition from a certain Edward Coke, Army Surgeon, who asks to be retained in the Army, and states that although "one Death, who does and will prevail," had carried off many of his patients, it was not due to the surgeon's want of care, but the will of "the great God of heaven." He also forwards a statement from those of his patients who had survived in support of his petition. General Monk was always anxious to have well-qualified physicians and surgeons in his army. He considered the rate of pay too small, and therefore, in some cases, showed his surgeons also as private soldiers on his pay-sheets. In this way the surgeon obtained a private's pay in addition to his own. Monk also strongly remonstrated against the appointment of inefficient medical officers to his army. Firth quoted a letter which Monk wrote protesting against the appointment of a Mr. Fish as surgeon to the artillery train. Fish had formerly been obliged to resign his appointment as surgeon's mate in order to avoid a court-martial for misconduct. He had never served his apprenticeship to any surgeon, and, Monk says, "the Surgeon-General looks upon him as unfit to take such an employ upon him," and asks that "if possible I may have an able surgeon to the train, in regard I know not what occasion I may have to make use of him myself, and I

conceive this person not fit to undertake it, as well for his want of skill as former miscarriages."

When no army medical officer was available the soldier was treated by the local civil practitioners. The Record Office possesses several of the bills presented for payment by such civil surgeons. One contains items, sixpence for a powder, eighteenpence for a cordial, and two shillings for a purge. The bill of George Blagrave and his son, which the curious may read in full in Firth's "*Cromwell's Army*," was paid on September 18th, 1645, and contains, amongst other items, the following :—

"John Bullock, of Capt. Barton's, a very sore cut in the fore part of his head, which caused a peece of his scull the breadth of half crown peece to (be) taken forth, allsoe a very sore cut over his hand £1 10s. 0d."

"For cureing 10 Caveliers taken at the fight at Ashe, whereof one was shot into the arme in the elbow joynt and the bullet taken forth in the wrist near the hand. The rest were sore cut in their heads and thrust in the back £5."

It has already been shown that London was the base to which the Parliamentary wounded ultimately found their way, and that, in 1644, a hospital had been fitted up for their reception at the Savoy. This accommodation was found to be insufficient, and in 1648, Parliament converted Ely House into a military hospital. The two hospitals, the Savoy and Ely House, were able to accommodate 350 patients, and were administered by commissioners appointed by Parliament. Nurses, chiefly the widows of soldiers, were engaged to look after the sick and wounded in the proportion of one nurse to each twelve patients.

Parliament had now, for a time, subdued the Royalists in England, and was at last able to make a thorough attempt at the conquest of Ireland. Ireland was largely in Royalist hands, and the rebellion which had broken out in 1641, in which year there had been a terrible massacre of the Protestants in that country, had never been suppressed. The rebels had joined hands with the Royalists in their opposition to the Parliamentary troops, and held nearly the whole country, except Dublin and a few other towns. In 1649 Cromwell landed in Ireland with 16,000 horse and foot, and, in September, laid seige to Tredah (Drogheda), which place was strongly held by the Royalist troops. Cromwell quickly realised that Parliament could not afford to lock up a large army in Ireland for any length of time, and determined to strike quickly and strongly. His methods against the Irish have been condemned ;

is not "the curse of Cromwell" remembered in the speech of the Irish to this day? There is, however, much to be said in Cromwell's favour. England had been horror-struck by the atrocities perpetrated by the Irish in the massacre of 1641. No doubt the accounts of these had been exaggerated, but the English people had not forgotten, and Cromwell and his men were the instruments of vengeance. Cromwell, however, does not appear to have been actuated by feelings of this kind, but wished, by striking terror into the hearts of his opponents at the first, to bring the war in Ireland rapidly to a close, and prevent it degenerating into a guerilla warfare, expensive, inconclusive, and long drawn out. Three thousand Royalist horse and foot held Drogheda. The weather was wet and cold, and although the Parliamentary forces were provided with tents, there was much sickness. Cromwell wrote: "Yet the country-sickness overtakes many." As soon as the breach was practicable Cromwell called upon the garrison to surrender, telling them that unless they surrendered all would be put to the sword. The garrison refused. On September 11th, 1649, Drogheda was taken by storm, and practically the whole garrison slaughtered. In his letter to the Speaker of the House of Commons describing the affair, Cromwell gives a list of the Royalists killed, and this list ends, "2,500 Foot-soldiers, besides Staff Officers, *Surgeons*, &c." His own loss was about one hundred. He now marched against Wexford, and "divers sick men, both horse and foot" were left behind at Dublin (about 350 horse and 800 foot), who afterwards recovered and rejoined the Army. Wexford was taken a month after the fall of Drogheda, and the army moved to Ross and Waterford. In letters from these places Cromwell wrote: "I scarce know one officer of forty amongst us that hath not been sick." "I tell you a considerable part of your army is fitter for an hospital than the field." After the fall of Wexford plague and dysentery ("the country-disease") broke out amongst the Parliamentary forces, and large numbers fell victims to these diseases. Owing to the severe winter the great amount of sickness amongst his troops, and the stubborn resistance of the Irish, Cromwell was obliged to raise the siege of Waterford. Cromwell's second in command, Michael Jones, died, and Cromwell himself fell ill. Youghal, Cork and Kinsale were soon taken. When the army advanced to the siege of Clonmel the sick and wounded were left at Fethard. From before Clonmel, Cromwell wrote to Lord Brayhill that "he was in a miserable condition; his army suffering from the bloody flux." After the capture of Clonmel, Cromwell returned

to England, where his services were required, Scotland having declared in favour of Charles II. The war in Ireland continued until 1653, where it was conducted by Monk, Ludlow, Ireton and Fleetwood. Limerick was besieged and plague broke out in the town, where pest-houses were provided for those sick of the disease. Ireton, Cromwell's son-in-law, died here. Galway surrendered to Ludlow in 1652, and all the Irish were ordered to leave the town except the "sick and bed-rid."

During the twelve years of war in Ireland, 1641 to 1653, the ravages of war, famine and plague were so great that one-third of the whole population disappeared. In 1652 Parliament confiscated the greater part of the landed property of those Catholics who had taken part in the rebellion. These estates were parcelled out amongst Cromwell's soldiers, in accordance with a resolution of the House of Commons in 1647, which decided that the back pay of the troops in Ireland, or as it was put, "pay which was respited on public faith," "shall be made good to them out of the rebel lands by English measure, according to the rates and proportions settled by Act of Parliament upon the finishing of the war." A large amount of back pay must have been due to many Parliamentary officers at this time, for the arrears went back in some cases to 1643, when Parliament had kept back half the pay of all officers whose pay exceeded 10s. a day, and one-third of the pay of those in receipt of less than 10s. a day. A preliminary survey of the country was made by an army physician, Benjamin Worsley, but this, being incorrect, was followed by a better survey made by another army physician, William Petty. Two-thirds of the Irish lands thus changed owners. The Catholics were transplanted to Connaught. This transplantation was not, however, general. Artificers and labourers were not transplanted, and many others obtained exemption. Apothecaries escaped on condition that they gave their services to the soldiers. It is on record that, owing to a lack of medical men in many parts of the country, several medical practitioners were exempted. Thus, Sir William Fenton, Major-General Jephson, and many other persons of quality, petitioned the Commissioners for the Affairs of Ireland in 1656, desiring that Dr. Anthony Mulshanoque might be permitted to continue to reside among them, the locality being "destitute of physicians of ability." A similar exemption was granted to Dr. Richard Madden, of Waterford, in 1654, on the certificate of Colonel Leigh and his officers.

There are many references in the "Calendars of State Papers,

Domestic," to the want of surgeons and physicians in Ireland. For instance, on January 20th, 1652, the Council of State wrote to Drs. Clerke and Wright, saying, "Several very considerable military officers are sick in Ireland, and there is a great want of physicians. Think of some fitly qualified, who will be willing and presently ready to be despatched thither, and send their names to the Irish and Scotch Committee, by whom care will be taken to furnish them out, and order will be taken for their established maintenance. In regard of the necessity of the service, return the names of two or more with all speed." Two days later the Council of State directed "the Irish and Scotch Committee to make an agreement with Sir Maurice Williams, Dr. Denham, and Dr. Goldsmith, M.D.s, for going over to Ireland, and to take care that they are forthwith despatched." On February 4th the Council informs the Parliamentary Commissioners and the Commander-in-Chief in Ireland that an agreement has been made with Drs. Denham and Goldsmith to go over on these conditions: pay, £1 a day, payable monthly, £15 for a horse, and advances of pay of £100 and £60, respectively. An entry on June 17th, 1652, reads: "To Dr. Adam Stryall and Dr. Curtis for travelling expenses of themselves and families to Ireland, to reside as physicians—each £30." On August 28th of the same year, Petty received £100 for his expenses on going to Ireland as Physician to Lieutenant-General Fleetwood. Nurses were also sent to Ireland. In February, 1652, Susannah Holbrooke was paid £10, "for defraying her and her husband's expenses to Ireland to attend to sick soldiers."

During the war in Ireland, Dublin was the base to which most of the chronic cases of illness or of injury were sent. Parliament established in 1649 two hospitals for their reception in Dublin. One of these was in the Archbishop's house, the other in a Roman Catholic chapel or "Mass-house" in Back Lane. According to the "Calendar of State Papers, Domestic," these hospitals provided accommodation for 200 sick and wounded men. There was a plentiful supply of nurses to attend on these patients, the scale allowed being one nurse to every ten. These nurses received pay at the rate of £10 a year.

Soon after the execution of Charles I., Scotland declared for Charles II. Charles II. went to Scotland and was crowned at Scone. He was accompanied by Richard Wiseman, the most distinguished surgeon of his time. Wiseman was surgeon to the King's person; the King's apothecary was Mr. Chace, and the King's physician, Sir Alexander Frasier (or Frazer). Frazer was

an M.D. of Montpellier in 1635, incorporated at Cambridge in 1637, and became F.R.C.P. London, in 1641. From many references in Clarendon's "History and Papers," he appears to have enjoyed considerable influence over the King, and was a man of some political importance. Pepys, in his "Diary," notes: "Dr. Frazier could do what he pleased with the King and with the Prince, they all having more or less occasion to make use of him." Frazer served on the Royalist side throughout the war. He was with Charles II. when Prince of Wales, commanding the King's forces in the West of England, for Wiseman tells us he met him in consultation during this campaign; and he accompanied the Prince to Scilly, and afterwards to Jersey. He was King's Physician in the Scotch Expedition of 1650, marched with the King into England, and was present at the Battle of Worcester. After that battle he contrived to escape to Flanders, and soon rejoined the King at Paris. After the Restoration his influence over the King became very great. He appears to have had considerable skill in his profession, for at times of truce he was consulted by Parliamentary officers, amongst whom was Colonel Hutchinson. Clarendon wrote of him "no doubt he is good at his business, otherwise the maddest fool alive." Frazer died in 1681.

Wiseman tells us that the Scottish Army under Leslie had a surgeon-general, one named Penycuke, "an eminent chirurgeon of that nation," and that he was assisted in his operations by Penycuke and Chace.

In July, 1650, Cromwell entered Scotland with an army of 10,500 foot and 5,500 horse. His communications with England by land were soon cut off, and his army would have been unable to exist had it not been for the support of the English fleet, from which he drew supplies. In August victuals became scarce and disease rife. Cromwell wrote from Dunbar, in September: "Our lying here daily consumeth our men, who fall sick beyond imagination"; and later, in a letter to Ireton, "A heavy flux fell upon our army; brought it very low—from 14,000 to 11,000." Before the battle of Dunbar, 500 sick and wounded men were sent on board ship at Musselburgh. Dunbar was selected as the base because it possessed "accommodation for sick men." At length relief came. On September 3rd, 1650, Leslie came down from the hills and gave battle. The Scottish army numbered 23,000 men, Cromwell's army only 11,000. Leslie's loss in the battle amounted to 3,000 killed and 10,000 prisoners. The English loss was only 30. The day after the battle at Dunbar, Cromwell issued a proclamation permitting the

Scots to remove their wounded, provided no arms were taken away. He also dismissed four or five thousand prisoners who were starved, sick, and wounded, and sent a like number of prisoners to England. In England these prisoners suffered greatly from sickness, largely due to overcrowding and want of food. Parliament afterwards engaged a number of surgeons, at 4s. a day, to attend upon them.

Parliament was so rejoiced at the result of the battle of Dunbar that it ordered medals to be prepared and issued to all, officers and soldiers, "that were in this service in Scotland." The medal was designed by Thomas Simon, and bore Cromwell's effigy. It was issued in gold and silver, and was the first war medal given the soldier. Cromwell next marched against and took Edinburgh and Perth. In February, 1651, he fell ill with malaria, and Parliament, in its alarm, sent Drs. Bates and Wright from London to attend him. Monk carried on the war in Scotland and took Stirling and Dundee. At Dundee the garrison was given no quarter.

In 1654, Heriot's Hospital in Edinburgh became the base hospital for the Parliamentary Army in Scotland, the revenues of the hospital being diverted for the support of the sick and wounded soldiers treated there. The patients were divided into two classes, sick and convalescent. The cost of feeding a sick man came to 4s. a head per week. The dietary was liberal. Each man received 2 lbs. of bread and a Scot's pint of beer daily, 5 ozs. of butter and 5 ozs. of cheese on four days of the week, and 1½ lbs. of meat, and a pint of milk or gruel on the other three days. Convalescents found their own food, and were allowed 3s. 6d. a week for this purpose. Nurses were provided on the scale of one nurse to every five sick men, and one nurse to each convalescent ward. These nurses received from 4s. to 4s. 6d. a week as pay.

Reference has already been made to other military hospitals established by Parliament. The maintenance of order in these hospitals was rigidly enforced, a code of regulations having been drawn up by order of the Committee for sick and maimed soldiers ("Calendar of State Papers, Domestic.") If a sick soldier misbehaved himself when in hospital he was fined. A third offence was punished by expulsion. If a nurse neglected her duties or created a disturbance in hospital by brawling or scolding, she could also be expelled. Marriage between a patient and his nurse was forbidden on pain of expulsion.

A further instance of the solicitude of the Government under Cromwell for the care of the sick and wounded soldier is shown by an entry in the "Calendar of State Papers, Domestic," 1652, which

states that the Council of State sent 220 sick soldiers, in charge of two officers, from the hospital at Ely House to Bath, "for the recovery of their limbs and perfecting their cure," by means of the medicinal waters there.

The Battle of Worcester, in September, 1651, may be regarded as the closing scene of the Civil War. Charles II. was utterly defeated, and fled the country. The battle is of little interest to the medical reader, but we may note that Wiseman, the King's Surgeon, was here taken prisoner; Frazer, the King's Physician, was present, but escaped after the battle; and it is probable that Worcester was the battle where Thomas Sydenham, the great physician, who fought on the Parliamentary side, was "left in the field among the dead."

The first great military expedition of the English to the Tropics took place in 1654-56. It was directed against the Spanish possessions in the West Indies. The force numbered 9,000 men, of whom only 1,000 were old soldiers, and was under the command of Admiral Penn and General Venables. In April, 1655, the troops landed in Cuba. Marching through tropical jungle, poisoned by water from a disused copper mine, soaked by tropical rain, without shelter or proper equipment, it is not surprising that hundreds fell victims to dysentery. Then, to crown all, they were twice ambushed by the Spaniards; many fell, General Heane was killed, but, rallying, they beat off the Spaniards and returned to the ships. Gardiner says, in the second ambush the Adjutant-General, Jackson, was the first to bolt. He was afterwards tried and cashiered, and "sent to the hospital ship to swab decks for the wounded." This is, I believe, the first instance of a hospital ship being attached to an English military expedition. The force had already lost eight colours and 400 men. In May, Jamaica was taken, and here our army had its first experience of yellow fever. Twenty men died daily, and yet the weakened battalions contrived to beat off, with brilliant success, a Spanish attempt to recapture the island. General Venables, in his account of the expedition, wrote: "Whoever comes into these parts must bring leathern bottles, which are more needful here than knapsacks in Ireland." Water-bottles were not issued to the soldier until the reign of William III.

The English soldier, under the Commonwealth, also saw service in Flanders. After the capture of Dunkirk, the English General, Sir William Lockhart, found that he had to provide for the care of 700 sick and wounded men. A hospital was therefore established, and the nuns of a nunnery in the vicinity contracted to provide

nurses and subsistence for the sick at the rate of one "styver" per day for each sick soldier. One nun was in charge of each eight patients. The arrangement proved to be unsatisfactory; eight small hospitals were therefore established, one for each regiment. This is one of the earliest instances (if not the first) of the provision of *regimental* hospitals in our army. The provision of food for the patients (and of a "convenient number of women to wait upon them") was intrusted to the care of a sutler. A great deal of sickness and suffering among the troops during this expedition was caused by the want of shelter. The soldiers had no tents, and no huts could be built for them owing to the lack of wood. Letters written by officers who were present refer to the great discomfort and sickness caused by the want of tents and huts. One Engineer officer wrote: "We send every day no less than ten, twelve, or more to the grave, for we have here about two thousand men, and have not accommodation for six hundred of them."

Tents were not provided for soldiers during the war in England. Cromwell had them issued to his troops in Ireland in order to keep his men in good health ("Cromwell's Letters," cv., cvii.). Cromwell's Scottish Army was, at first, without tents; but one tent to each six men was afterwards provided. Firth thinks these tents were small, and divisible into parts, so that each soldier could carry his share. Monk, while in Scotland, was careful to see that his men had tents, and further, that they kept them in proper repair. No tents were taken on the expedition to the West Indies.

The measures taken by Parliament to provide for the care of the sick and wounded soldier when on service have been described, but to the Long Parliament the soldier also owes the first declaration that it is the duty of the Government to provide for the disabled soldier, and for the soldier's widow and orphans. In 1642 Parliament published a declaration promising to provide for disabled soldiers, their wives and families, and for soldiers' widows and orphans. Collections were also made in the London churches for this purpose, and old clothes, linen, and woollen stuffs collected for the use of the wounded. In 1643 the parishes were called upon to support wounded and disabled soldiers and the widows and orphans of soldiers. In November, 1643, Parliament levied a tax of £4,000 a month, for six months, on all the counties in its power for this purpose. "Treasurers for maimed soldiers" were appointed to control the expenditure. Four shillings a week was the maximum allowance to a soldier's family. In 1644, over £10,000 a year was charged against the Excise for the same purpose. When the Long Parlia-

ment ceased to exist the Council of State appointed a committee to administer the military hospitals and funds, amounting to £45,000 a year, for the provision of pensions for disabled soldiers and soldiers' widows and orphans. About 6,000 persons were thus provided for. The payments fell into arrears, and, when the Restoration came, the remaining pensioners—1,840 disabled soldiers and 1,500 widows and orphans—were given twelve weeks' pay apiece and thrown on the care of their parishes, in accordance with the provisions of Statute 48 of Queen Elizabeth. Soldiers unfitted for duty in the field but fit for garrison duties were sent to garrisons, the germ from which sprang the invalid battalions of later times.

NOTE.—The chief authorities consulted in the compilation of the above paper include: Grose's "*Military Antiquities*," Rushworth's "*Historical Collections*," Clarendon's "*History and Papers*," "*The Thurloe Papers*," "*Fairfax Memorials*," Ludlow's "*Memoirs*," "*Hutchinson Memoirs*," Nehemiah Wallington's "*Historical Notices of the Reign of Charles I.*," "*The Calendars of State Papers, Domestic*," Carlyle's "*Cromwell's Letters*," "*Gardiner's History*," Longmore's "*Life of Wiseman*," Fortesque's "*History of the British Army*," C. H. Firth's "*Life of Cromwell*," Morley's "*Cromwell*," Gore's "*Our Services under the Crown*," and that most admirable work, C. H. Firth's "*Cromwell's Army*," which contains the best account of the Parliamentary Army in all its branches yet written.



REPORT OF THE ROYAL COMMISSION ON THE WAR IN SOUTH AFRICA.

As the actual volumes of this important report are unlikely to be accessible to the majority of members of our Corps, while the evidence contained in their pages cannot fail to be of interest to our readers, we propose giving a *précis* of the evidence so far as it relates to medical organisation before and during the late campaign. For this summary, which is continued from p. 314, vol. iii., we are indebted to Lieutenant-Colonel Edwin Fairland. It deals mainly with evidence regarding medical equipment.

SURGEON-GENERAL J. JAMESON, C.B., examined, said :—

(Q. 11,472.) I was Director-General of the A.M.S. when the war broke out. I was appointed on May 7th, 1896. The establishment of the R.A.M.C., as fixed in 1888, was 514 officers, exclusive of India, and these, with the addition of 99 civil surgeons, were supposed to provide attendance for the Colonies, for two Army Corps and a Cavalry Division, with some lines of communication. The understanding was, that when that service for the field army had been provided, our home hospitals would be left destitute of *personnel*. That was part of the scheme of the (W.O.) Committee. The belief was, that with the aid of retired medical officers and civil surgeons there would be very little difficulty in carrying out the work. We would not denude the colonies at all. We had enough officers for the two Army Corps and the Cavalry Division. The establishment of the men was designed for a state of peace. I could hardly tell you why the two establishments were placed on a different basis.

(Q. 11,489.) Did it ever occur to you, during the tenure of your office, that difference of systems required some explanation? There had been a very great number of changes in a number of years, with regard to the organisation of the Corps. The system as regards the men was just sufficient to provide for a peace footing. For all the home garrisons, and for the garrisons abroad, exclusive of India.

(Q. 11,493.) And a war establishment was never contemplated at all as regards the men? That is correct.

(Q. 11,494.) But a peace footing for what force? For the strength of the Army. The only thing about that is, that while the Army went on increasing, our men did not increase in corresponding ratio, so that we have been very hard up for many years, even on a peace footing.

(Q. 11,498.) After you assumed your office did you represent that the men were not sufficient? I did, repeatedly. We got a small increase. "To explain the small number of trained orderlies of the R.A.M.C. at the commencement of the war, I must refer to the constant struggle that has

been in progress for many years to obtain what was considered an adequate establishment for the Corps. In our estimates for 1893-4 an increase of 212 was asked for, but only 54 were granted, and in the estimate for the following year, 1894-5, it was very strongly recommended that the balance, viz., 158, might be sanctioned on the ground that we had to employ a considerable number of regimental orderlies, and we had not a single warrant officer or N.C.O. under 'Reliefs and Miscellaneous' to meet casualties, and only 67 privates, as compared with nearly 200 of all ranks which had been allowed in 1886-7. However, it was decided that only 53 should be sanctioned. Similarly in 1896-7 105 were asked for, partly on account of increased establishment in Egypt; 52 were given. In 1897-8, the balance, viz., 53, was again asked for, and it was stated that 'every little expedition undertaken means that the N.C.O.'s and men of the Corps have to be withdrawn from the hospitals at home in order that the necessary hospital staffs may be furnished to the expeditionary force.' An increase of 55 men was then sanctioned, but the Adjutant-General considered that wars are intended to be provided for by depleting our home hospitals, and that the remedy for that is extra women nurses and active recruiting."

(Q. 11,501.) What are you reading from? I am reading from the evidence which I gave before the Royal Commission on South African Hospitals. Those representations were made to the Adjutant-General. The matter was frequently discussed at the Army Board; that is the usual place at which these things are discussed. I was usually present at all meetings of the Army Board when the Medical Department was concerned. The decision of the Board was always against me on these points. They did not want to increase the Medical Corps. The argument given was that the trained soldier is the only man you cannot purchase in the open market, and that all the money was wanted for trained soldiers.

(Q. 11,509.) But what I want to arrive at is this: that it was the military opinion that was against you? Quite so.

(Q. 11,514.) That is as regards the number of men. Were you satisfied with the number of officers for the establishment? No; the number of officers for many years has been very much below what it ought to have been, in fact, some years ago, following Lord Randolph Churchill's Committee in cutting down the expenses all the time, our establishment became insufficient in proportion to our requirements. At one time, I think, we had nearly 1,000 altogether, and although the Army had increased, our members had decreased.

(Q. 11,517.) Since your time has there been any considerable reduction? No, it is practically the same since my time, that is to say, for the home establishment and colonies, 514 increased to 540, and since the war we raised it by 100 temporarily.

(Q. 11,518.) During the Egyptian campaigns what happened? We

had to send out from our establishment at home a sufficient number to provide for their wants in Egypt by depleting the home establishment.

(Q. 11,519.) And then how did you make good the depletion in the home establishment during the progress of the Egyptian campaigns? Practically it amounted to this, that officers got a much shorter time of home service, and had to do double work. We had a smaller number of officers at each station, and we had difficulty in giving leave.

(Q. 11,520.) Did you supplement it by the appointment of civilians? A great deal. We have done that all along. We took the orderlies from the home establishment. If there was a war anywhere in Egypt, or in Crete, and men were wanted, we took them from the home establishment, or very often from Malta, which was nearer; and then sent out to Malta the number of men required to replace them. If the hospitals suffered, which they did to a certain extent, we applied to Commanding Officers for private soldiers. Those men were untrained men. Some Commanding Officers sent us good men, and others sent us, I think, their worst. This was represented, and some improvement took place.

(Q. 11,531.) Then your establishment of officers is estimated as sufficient for two Army Corps. What happened when the war broke out? The first idea was, that it was going to be one Army Corps, and we sent out the First Army Corps complete in every detail. Then the Second Army Corps had to be formed. There was a demand made for an additional number of base hospitals and stationary hospitals, according to the long line of communications, and we had to take the officers and men intended for the Second Army Corps to supply these lines of communications. Therefore, when we had to send the Second Army Corps we had not got them fully, and had to go to the highways and byways for them. Our numbers were exhausted before the end of the year. We sent out 2,200 before the end of 1899. Our men were practically exhausted when we sent out the First Army Corps. We kept, of course, a few. We had to keep on our hospitals just the same, and could not possibly take away all the men who knew the working of the regulations, and put in men who knew nothing about it. An Army Corps takes about 800 N.C.O.'s and men; about $2\frac{1}{2}$ per cent. on the strength of 40,000 men.

(Q. 11,543.) We have had it in evidence that 5 per cent. is the right percentage of men of the R.A.M.C. for any force that you choose to employ, under the most favourable conditions. What do you say to that percentage? I think it is very liberal; it is probably more than we should ever get.

(Q. 11,547.) You cannot foresee, you cannot estimate the probable amount of sickness in an army, can you? You can, in a general way, by a knowledge of the percentage of sick in previous wars, and in other countries. We have had a good deal of experience in South Africa, in Egypt and other places, and we know exactly what other armies have done, and what they required. The amount of sickness in foreign armies

was always more than double ours; our results have always compared exceedingly favourably with the results of all other countries.

(Q. 11,558.) Before the war broke out, you must have formed some estimate of the probable numbers of sick; what was it? Ten per cent.

(Q. 11,560.) How has the experience of South Africa borne out that estimate? The percentage of sick in South Africa has never reached 10 per cent. Including the Bloemfontein enteric epidemic it was a little under it. The calculation was almost absolutely correct.

(Q. 11,562.) What number of men and officers would you have considered before the war was the proper percentage for the number of men sent out; $2\frac{1}{2}$ per cent. you told us just now? Yes.

(Q. 11,563.) You adhere to that? Yes, I adhere to that, under favourable conditions.

(Q. 11,564.) What was the percentage actually employed, including voluntary aid and everything else? Now you can look at that table. The greatest was 4.23.

(Q. 11,565.) That is very considerably in excess of what you think would have been required? Yes.

(Q. 11,566.) And yet you would not be prepared to say that there was a greater number of the R.A.M.C., plus voluntary assistance, than was really required, would you? No, I do not think I would say that, under the circumstances.

(Q. 11,567.) Do you not think under those circumstances that you would now rather correct your figure of $2\frac{1}{2}$ per cent? Well, it is certainly not too liberal.

(Q. 11,570.) What have you to say about the training of the officers in the R.A.M.C.; is there anything that you would like to say upon that point? I think the training has been very good, excepting that there is this to be said, that on account of our depleted establishment, or rather on account of the increase of the Army, it was very difficult indeed for officers to get leave to study. The training in preparation for entrance to the Army is very good.

(Q. 11,571.) That is to say, you think that the young men who come into the Army as surgeons, up to the point of coming into the Army, are very well taught and trained? Yes, they join at Netley, and for four months (in my time) they were put through a course of hygiene, bacteriology, military surgery and medicine, and regulations, and the work of a military hospital . . . they were sent for two months to Aldershot, where they picked up the military part of their work; they were put in the barrack square and taught their drill—ambulance drill; had to do orderly officer, and were initiated into military ways; after that they were drafted to one of the large hospitals, such as the Herbert Hospital.

(Q. 11,577.) How many patients has the Herbert Hospital? During the war it had over a thousand; in normal times about 700. As a rule a medical officer would take charge of 50 cases.

(Q. 11,581.) Then, do you think that, from the point of view of an officer going into one of these big hospitals onwards in his training there, he gets as much experience as a civil surgeon, or physician in a civil hospital? Well, he gets experience of a certain kind. I do not think, take it all round, it is equal to the experience desired by a man doing duty in a civil hospital; but he gets experience in some diseases. Venereal disease, of course, is ever there. But when he goes abroad he gets great experience in a disease that the civil surgeon does not to the same extent—that is enteric fever. Fevers generally, and rapid diseases of different kinds. Of accidents as a rule he does not see very much. He does not get much surgical experience. I do not think I ever, myself, performed a major operation until I went to the Franco-German War.

(Q. 11,585.) Yet for the actual duty which an army surgeon has to perform in war, I take it that would be the most valuable experience of all? No doubt it would be valuable. He cannot get that experience in operating anywhere, except on a dead subject. Under the existing system he cannot get it at home.

(Q. 11,587.) Has it ever occurred to you that the system might be changed in some way to meet the difficulty? Yes, the subject has been discussed for years—that is to say, how to improve the medical officer on his return from foreign service. The only way, it would appear, is to give him leave to study in one of the home schools.

(Q. 11,590.) Has that ever been proposed? Yes, and sanctioned. I never refused a medical officer leave to study, but there were sometimes difficulties in regard to his own P.M.O. of the district. He would say, "I am sorry, but I cannot spare you."

(Q. 11,592.) That would be a voluntary system, would it not? Yes, there was no other.

(Q. 11,594.) The military authorities have never considered some compulsory system? Never.

(Q. 11,595.) What would you say to that? I think every medical officer on returning home should be granted leave to study.

(Q. 11,596.) But should he not be made to study? I think he should.

(Q. 11,597.) Has that ever seriously been considered by the military authorities? I do not think it ever could be on account of our strength. If you ordered every man, say, for six months to a civil hospital, I think you would have to increase your establishment almost one-third to do that.

(Q. 11,599.) Would there be any difficulty in attaching military surgeons to the civil hospitals? Not the slightest. I believe it is done now. I raised the question several times with the London surgeons, saying, "Would you give us some of your appointments in the hospitals, such as house surgeons?" and, as a rule, they refused. They said, "No, these are for our own schools; we cannot afford it. We should be very glad to see your officers, but we cannot give them the house surgeoncy."

(Q. 11,607.) There has been a good deal of criticism of the medical

and surgical material sent out to South Africa. Who is responsible for that sending out? There is an officer appointed at the War Office, whose business it is. He is directly under me. He is a good man, chosen for his work, and a remarkably good man, who gave evidence here the other day, Col. Johnston. He and Col. Gubbins are the two men, and also the present Director-General, Sir William Taylor.

(Q. 11,610.) Had they perfect liberty in choosing the equipment and instruments and so on, that were sent out to South Africa? There was a certain pattern as regards instruments. In my time there was a great improvement made. There were old-fashioned instruments when I became Director-General. The new pattern was fixed about the year 1898, the year after I came into office.

(Q. 11,615.) Were the whole of the R.A.M.C. and the whole of the officers supplied with the new equipment between 1898 and December, 1899? Perhaps not all. That would have involved very considerable expense, and we wanted to use up the material as fast as we could.

(Q. 11,617.) Did you obtain from the War Office sufficient funds to enable you to re-equip the whole of the R.A.M.C. between 1898 and December, 1899? No.

(Q. 11,618.) Therefore, I take it, it is not very surprising if a good many officers went out with the old equipment? Very likely.

(Q. 11,619.) That is no doubt the explanation of the criticism we have heard? Yes.

(Q. 11,620.) But you are satisfied now with the equipment as it stands? I think it is very good. Of course, you understand every surgeon has his own fads. There are not two surgeons in London who would agree as to what ought to be the proper instruments.

(Q. 11,621.) I take it that one of the essentials is that instruments should be quickly and easily sterilised? Certainly that was our object in changing them. We could put them all into hot water and boil them at once.

(Q. 11,622.) And with your new equipment can you put case and instruments into hot water at once? Yes.

(Q. 11,624.) As to medical stores, medicines, and things taken out, were they mostly in tabloid form? A great many of them were.

(Q. 11,627.) When you assumed office in 1896 what was the condition of the medical store? It was unsatisfactory.

(Q. 11,632.) I suppose that your deficiencies as regards storage room and so on were all represented by you to the War Office? Yes.

(Q. 11,633.) And there again you were refused the necessary funds? Yes, the thing had been discussed over and over again—always by military authorities, so far as I was concerned.

(Q. 11,635.) Therefore, so far as you were concerned, you have been blocked all through by the Army Board? Quite so.

(Q. 11,636.) I suppose that when you came to sending out medicines

and drugs, and so on, to South Africa, you sent out what you had in the first instance at any rate? In the first instance we had, of course, sufficient for the field army, and for both an advanced and base dépôt too; and we had a considerable reserve; it was rather old-fashioned. Immediately we saw it was going to be a big war we sent out immense quantities. What we had in reserve was exhausted the first month. We never had the slightest difficulty in buying.

(Q. 11,647.) I asked you about the training of officers, but I did not say anything about the training of your hospital orderlies; do you think that is satisfactory? I think it is fairly satisfactory. My experience of our men is that they are very good. They act as nurses, being taught by the nurses themselves. When enlisted they are taught the military part of the training, simple manœuvres, so that they can march together, then ambulance work; then they are put into hospitals and are taught by the N.C.O.'s and nurses, who are the chief teachers. All the hard nursing work is done by our men. Our nurses are chiefly superintending. They keep the orderlies up to their work. Each nurse has under her charge, say, three wards and a certain number of orderlies. When she is doing night duty, she would go round the whole hospital and see that the patients are being properly cared for by our own men. The establishment of men requires a considerable increase; we are very much undermanned.

(Q. 11,663.) Is there anything you would like to add to what you have said? There is one thing I would like to add—not much notice has been taken of it. Not only when our establishment was exhausted, both for officers and men, it was the fact that all our home hospitals had to be carried on just the same, but in addition to that, we had 50,000 invalids sent home on the top of us, and all that had to be provided for by our depleted establishment, and you can imagine what work that was. So that I think any plan whereby all our trained men are moved away from our hospitals at the beginning of the war must necessarily be bad.

(Q. 11,664.) It all resolves itself into this—that from 1896, when you assumed office, you felt that you were starved by the War Department, and that you were in a continual state of conflict with them with regard to establishment; is not that so? That is the case.

(Q. 11,668.) The requirements of the Medical Department in the South African War were very much greater than in any ordinary war? They were greater than in almost any war I have ever heard of, on account of the enormous lines of communications and the roads of the country in which we were operating, which were very bad roads.

(Q. 11,669.) There were many difficulties probably that would not have arisen in a civilised country like Germany or France? Undoubtedly; there was nothing to be got out of the country. I have been with an ambulance in France, but we had no difficulties there as compared with what we had in South Africa.

(Q. 11,671.) You spoke of the nurses; do you think they were very

efficient? Our nurses are remarkably good I never took one unless she had a certificate from a hospital, and we never appointed anybody unless she was exceedingly well reported upon. . . . The whole nursing service has been changed since I left office. Now they have a Committee for choosing them; in fact, the nursing service has been reformed since I left.

(Q. 11,678.) How do they come to have such a large reserve? They have been accumulating for years; we had altogether about a thousand reservists.

(Q. 11,681.) You were in the A.M.S., I presume, before the R.A.M.C. was constituted? Yes, I joined in 1857.

(Q. 11,682.) How was the nursing done then that is now done by the R.A.M.C.? It was done by orderlies from regiments. In some instances it was badly done, and in others exceedingly well done. I have known private soldiers as good nurses as I ever saw anywhere, nothing could exceed their devotion. I am speaking now of my experience in the West Indies during an epidemic of yellow fever.

(Q. 11,686.) You think, on the whole, that the present system is a much better one? Undoubtedly; there is no comparison. It was quite the exception in the old days to get a good orderly.

(Q. 11,687.) In the year 1857 there was a surgeon and assistant surgeon attached to each regiment? Yes.

(Q. 11,689.) Do you think that system as good as the present one? No doubt the present one is much more economical. The disadvantage of the old system was that the man responsible for the administration of the department had no control over his officers; they were attached to regiments, and the Colonel would not give up his officers. Now there is one surgeon for a brigade instead of two for each regiment.

(Q. 11,694.) So, in point of fact, he is doing the work that four men did formerly? Quite so. In time of war there is one medical officer to each unit. All medical officers are instructed as sanitary officers—they go through a course of hygiene and bacteriology.

(Q. 11,703.) Would you approve of a sanitary officer being attached to a brigade whose duty only would be concerning sanitary matters? Undoubtedly. It is a great misfortune that the sanitary officer was done away with. The regulation during the late war was that the P.M.O. should be his own sanitary officer. But he had a great many other administrative duties, and could not devote time to sanitary work. I sent out the most experienced bacteriologist I had, and fitted him with a bacteriological and chemical laboratory of a portable kind. He was in constant communication with Professor Wright regarding enteric, and his instructions were to go out and watch enteric fever. Sir Redvers Buller placed him on his own staff, he accompanied him to the battle of Colenso, and was shot dead. What became of that laboratory I never heard, and I do not know what was done with regard to sanitation, beyond the instructions I gave him before leaving.

(Q. 11,707.) I understand you to say that every medical officer was a sanitary expert? Yes, I gave them all written instructions as to the dangers they were likely to meet, and how best to keep the camps in a good state of sanitation; pointing out that enteric fever would be the difficulty with them.

(Q. 11,713.) With regard to enteric, do you think there was more or less in our army at the Cape than there is in foreign armies during campaigns; take the Franco-German campaign? Taking many campaigns, there was about an average. It was not so bad as it was in the Afghan War, but with our own expeditions and various wars it is just about even.

(Q. 11,723.) If the orderlies were better trained, if they were trained as completely as the nurses are, do you think that the mortality amongst the soldiers would be less? No doubt, theoretically, it would be, but it is very difficult working out "mortalities," because it so happened that the hospital in South Africa, at Bloemfontein, which was so unfavourably commented upon by Mr. Burdett-Coutts, where the persons were supposed to be lying on the ground uncared for, had a less mortality than other hospitals in South Africa from enteric.

(Q. 11,728.) What would you say, generally, were the lessons to be learnt from the war, so far as the medical department is concerned? The great lesson to be learnt is greater attention to details as regards sanitation, with a view to preventing enteric fever, not only to assist medical officers, but in a greater degree to assist military officers and the men themselves. The men require education as regards sanitation; they look upon all our recommendations as fads. They take no care about the water, or the character of it. What we did was never done in any other war before. We issued a sterilising filter (a Berkefeld) to every hundred men in South Africa; it is capable of filtering a considerable quantity of water in an hour. It required a good deal of attention—the dust and dirt adhered to the outside—and unless it was frequently cleaned it got harder to work; in a great many instances the men would not use them. They would not have patience. The ordinary Pasteur-Chamberland filter had been tried in West Africa, and was very unsatisfactory.

Sanitation is the great lesson to be learned. If it had been understood not alone by our officers, but by the rank and file and the military officers, I think it would have saved thousands of lives. Under ordinary circumstances one would have boiled water, but in the veldt you cannot get material to boil water; but my experience is, the men will not drink boiled water. I have been boiling water for twenty years in India and Egypt, and I never stopped enteric fever by it.

(Q. 11,738.) Of course we know that South Africa is the country of enteric, *par excellence*, but I think we may take it that in all great wars enteric has been the main disease? That is so.

(Q. 11,740.) And, as I gather also, that in past wars, certainly this last war, the number of deaths through disease largely exceeded the

deaths from an action; has there been any special instructions given to medical officers as to how to deal with enteric in time of peace in your experience? Yes, it is part of the course at Netley. Every officer goes through it; so far as enteric fever is concerned, there is no class of men in the world who have the same experience that our officers have with regard to the treatment of it. We have got far more experience than we want, I assure you. In time of peace abroad our every-day occupation is looking after enteric fever.

(Q. 11,747.) What were the qualifications required of medical officers on joining the army? After he passed the physical examination he was brought up before a special board of examiners, appointed by the Secretary of State—it was a competitive examination. The examiners were the best men we could find anywhere, representatives from the different schools. He would be examined on anatomy, physiology, the practice of medicine and surgery, and diseases of women and children; not bacteriology as a rule, but pretty much about the same as what he was examined in for his diploma. He went to Netley for hygiene and bacteriology.

(Q. 11,750.) Would you consider that the officers entering the A.M.S. were equal to those in civil life? Not only that; I think they were very much superior. I do not think, perhaps, they were the very cream of the profession, but I think the average is high.

(Q. 11,752.) A few years ago there was a difficulty in getting the class of men you wished to have; that was before you took up the position? Yes; and in my time, too, there was difficulty.

(Q. 11,753.) That was owing to their status, in a great measure, in the Army, and insufficiency of pay, was it not? Exactly; they found, or they thought, they could do better in civil life: and there were certain conditions that the medical profession itself did not approve of with regard to social standing and army rank.

(Q. 11,754.) So that at times it was almost impossible to get the men that were wanted? Nobody came up. There were no examinations held at all for some time, because there were no candidates.

(Q. 11,755.) In short, the Service may be said to have been boycotted? Public opinion, of course, exercises a great influence on young doctors as upon anybody else, and the feeling throughout the schools was antagonistic to the medical department.

(Q. 11,757.) We have had evidence that in the Continental armies in Germany and Austria, and in Russia, the position of the medical officer is better. He is recognised as being equal, socially and in every respect, to any of the military officers? I think it is a great pity it should not exist here.

(Q. 11,758.) Have you any recommendation to make from your great experience with regard to the position of the medical officer and the pay? I think the pay is very good for the new warrant—remarkably good. Of course, there were other things that prevented them joining.

(Q. 11,759.) Do you put any stress upon the relative rank given to medical officers? It is not relative rank now. What we did want for them was substantive rank, and that we have got. We have rank the same as any other officers.

(Q. 11,760.) You have got it by the institution of the Corps? Yes.

(Q. 11,761.) Do you attach any importance to that? Very great. . . . It has created what we very much wanted amongst us—*esprit de corps*. The men are getting to take a pride in the Service, and men with a pride in the Service will always do well.

(Q. 11,763.) Do you not think that the same *esprit de corps* might exist if the man was frankly a medical man, and not half a medical man and half a military man? In the Army there is no such thing; you must have substantive rank.

(Q. 11,764.) You mean that it would not be workable? It would not be workable.

(Q. 11,770.) Chaplains have no substantive rank? They have no substantive rank, and they have no relative rank, really.

(Q. 11,771.) But their position is quite secure? They are different altogether from us; they are not working with soldiers and living amongst soldiers, as we are, and having command of soldiers. We have to command our own Corps and patients in hospitals; we have to sit on Courts Martial, and do everything that every other military officer has to do.

(Q. 11,772.) And you refuse to admit that they would be in a better position if they were treated frankly as members of the medical profession, only attached to the Army? I think if they were simply medical men Tommy Atkins would show them very little deference.

(Q. 11,774.) You think so? I am quite sure of it.

(Q. 11,775.) Before they got the military rank, did the privates show a want of deference? We have relative rank, and we were always content with relative rank until we were told it had no meaning.

(Q. 11,776.) Who told you that? The Secretary of State for War.

(Q. 11,777.) But it had a meaning, because it gave you higher pay, higher quarters, and higher allowances? Yes, but it was explicitly stated that it had no meaning, that there was no such thing as relative rank.

(*To be continued.*)

Reviews.

THE PREVENTION OF MALARIA BY QUININE ACCORDING TO KOCH'S METHOD.

In submitting the following extract from a report by Edm. Sergent, published in the *Bulletin de l'Institut Pasteur* for July 30th, 1903, I beg to draw attention to the wonderfully successful results obtained by Koch's method of combating malaria.

The technique could not, under existing conditions, be applied to India generally, nor even to the West Coast of Africa, but I submit that it would be quite possible to carry it out thoroughly in one or more of the following stations: Barbadoes, Mauritius, Aden, Perim, Andaman Islands, St. Helena, or Bermuda. Of these Bermuda would probably be the easiest to work thoroughly, as there is very little malaria amongst the British troops, and in 1900 there were only fifty-one native soldiers attacked. More recent statistics I have not been able to avail myself of.

It will be noticed that Koch's method differs essentially from that of Ross in that he makes no attempt to destroy the *Anopheles*.

Extract from Edm. Sergent's Report.

Robert Koch has written a long article in the *Zeitschrift für Hygiene und Infektionskrankheiten* on the result of experiences, in various parts of the world, of the value of his method of combating malaria.

The principle of this method is based on the systematic and prolonged treatment by quinine of all those infected by the disease, and he thus compares his prophylaxis with that for cholera:—

It is an easy matter to discover the cholera vibrio in a person sick or convalescent from the disease, and it is equally easy to deduce therefrom the necessary prophylactic measures, *i.e.*, to isolate and disinfect the affected person.

He states that the same measures will be equally efficacious in malaria, for the microscopic examination of the blood of all the inhabitants of a malarious locality, and especially of that of the children, will show the presence of the parasite, not only in those actually suffering from the disease, but also in those who have only a latent paludism, which does not affect them, but which they can transmit, through the *Anopheles*, to healthy subjects.

When once it is known who are carrying the *hæmamœba* in their blood, a prolonged course of quinine will prevent the germination (French, *pullulation*) of the parasite, and thereby prevent the *Anopheles* infecting itself.

This method of Koch, therefore, differs essentially from the old preventive treatment by quinine. The *rationale* is that quinine is given to a number of people, healthy or sick, with the idea of preventing their being infected or of their infecting others, with the *proviso* that Koch only gives the quinine to those actually bearing the parasite in their blood.

He treats them for several months, two days quinine with an intermission of eight or nine days, until the parasite is no longer found in the blood. It is not necessary to examine them clinically, for the microscope shows who require the treatment, and also when it may cease.

Koch commenced his experiments in 1899 at Stephansort, and he now gives the result of experiments in Istria, Italy, the two German colonies in Africa, and at Wilmershaven. P. Frosch has continued Koch's experiments at Brioni, a small island off the coast of Istria, covered with sub-tropical vegetation, and with a climate comparable to that of the Riviera. There are about 300 inhabitants; but they are not permanent residents, and the majority only arrive when the harvest requires gathering.

In December, 1900, the blood of the inhabitants was examined, and all those in whom the parasite was found were treated with quinine. In June, 1901, the commencement of the malarious season, an even stricter examination was made, and all those refusing to submit to it were sent off the island. The examination was continued monthly, and every person who arrived on, or left, the island for however short a period was examined anew.

The actual treatment consisted of the exhibition of 1 gramme of quinine for two days consecutively. If fever occurred, or if, without fever, the blood contained large or small annular forms (*grand ou petites esformes en anneau*), 7 grammes of quinine were given in five days in 2, 2, 1, 1, 1, gramme quantities. The further treatment was 1 gramme of quinine for two days consecutively, every nine days for tertian, and every eight days for quotidian cases, for a period of three months. Later still 1 gramme was given for three days consecutively every eight days.

The results of the first year were as follows: Seventeen primary cases of malaria, and three relapses. In 1900 it appears that there were ninety-seven primary cases, thus showing a gain of 85, 5 per cent. rendered immune.

In 1902 the experiment was repeated, and this year 170 fresh labourers were introduced. There was not a single case of malaria amongst them, and there were only one or two relapses amongst the original inhabitants, with no primary case.

The author draws attention to the fact that in consequence of his treatment 170 people were able to pass the summer without danger on an island where, formerly, residence for a single night was sufficient to give malaria. He also insists that skilled attention is not necessary, as any intelligent person can collect the blood and send it to a central laboratory for examination, and the quinine can be equally readily given. Finally, the amount of quinine, given in the prescribed doses, to almost all the inhabitants, did not nearly amount to the enormous quantity consumed in former years.

Bludau made the same experiments in 1901, at Ossero (230 inhabitants) and Pentacroce (228 inhabitants). After considerable difficulty in persuading the people to allow their blood to be examined, he finally succeeded, and very few cases of malaria occurred.

Vegedes applied Koch's method in several districts in German South Africa. The results were as follows: At Franzfontein in 1901, out of 279 inhabitants, domiciled and travellers, the blood of 56 per cent. contained parasites. Of 175 residents, 75 per cent. had parasites. In June, 1902,

out of 240 residents, 6 per cent. had parasites. Analogous results occurred in other districts.

In the Tuscan Maremma in 1901 and 1902, under P. Gosio, almost equally favourable results were attained, but the conclusion was arrived at that treatment for at least four months was necessary, and he states that the ethyl carbonate of quinine is the best form for children, as it is tasteless.

The author considers that mechanical methods of defence, such as mosquito curtains, are practically useless, and that only under military supervision do they give even favourable results. He gives the following table, presumably tabulated from the Maremma cases :—

Mechanical defence only	...	...	...	44	per cent. cases of ague.
" " with quinine	...	...	...	16·5	" " "
Quinine alone	...	...	...	13·5	" " "
Untreated	..	...	...	84·18	" " "

He also states that by Koch's method it does not appear to be necessary to recommence the treatment every year.

Martini, who was in medical charge of the employées during the excavations for new docks at Wilmershaven in 1901, by following this plan of treatment, had an ague rate of ·5 per 1,000, whereas from 1858 to 1869, when the port was being built, the rate was from 204 to 227·7 per 1,000.

H. P. JOHNSON.

A MEDICAL HISTORY OF PRISONERS OF WAR IN CEYLON. By Allan Perry, M.D., D.P.H. Printed by G. J. A. Skeen, Government Printer, Colombo.

This little work is, as stated in the Preface, mainly compiled from the author's official reports to Government on the health of the Boer prisoners in Ceylon. It cannot fail to be of interest to officers of our Corps, since it deals with questions of real importance to all who have to administer camps, or to guard against epidemic disease. The administrative medical difficulties appear to have been fully foreseen and provided for. This is what we would have expected from the military experience of the author, who spent so many years in the R.A.M.C. We commend to our officers as well worthy of perusal, the history of the origin and spread of the epidemics of enteric and measles which occurred amongst the prisoners. This portion of the work gives evidence of careful investigation, the arguments being clearly stated and well reasoned. Altogether we are able to congratulate our brother officer, and incidentally therefore ourselves, on good work in the five camps for prisoners of war in Ceylon.

Current Literature.

The Etiology of Enteric Fever.—An interesting contribution to this important question is given by Priefer in *Zeitsch. f. Hygiene u. Infectious Krankheiten*, vol. xlv., Hft. 1, in which he discusses an epidemic of enteric which broke out suddenly in 1902 in a certain infantry regiment of the 8th Army Corps. The majority of the cases occurred between February 17th and 20th, during which period some eighty men reported sick with typhoid symptoms. The outbreak was traced to a soldier who, in the first week of January, 1902, went on furlough to Godenhof, a village in which a severe outbreak of enteric had occurred in the previous November. This man was known to be ill with diarrhoea on January 27th, but did not report sick until February 18th, when increasing sickness compelled him to do so. The outbreak was confined practically to a four-storied barrack, in which it was found that the soil pipe of a w.c. on the first floor had been stopped for some three weeks previous to the outbreak of cases. In consequence of this obstruction and a contributory fissure or crack in the pan of the w.c., the excretal material gradually percolated the adjacent wall and ceiling, and ultimately came in contact with a faulty supply-pipe to a w.c. on the ground floor. The man who was first ill was known to have used this first floor w.c. about the time of the soil pipe occlusion. A series of elaborate experiments with a solution tinted with methylene blue showed that any material gaining access to this defective supply pipe made its way into the water pipes of the block, more particularly those supplying the taps for culinary and drinking purposes.

An elaborate description is given of the mechanism by which the *materies morbi* gained entrance into the main water supply, from which it seems that the barracks are situated on a hill, on which, behind them, is a large water reservoir. Owing, however, to the height of the barracks, the upper stories do not receive a constant supply on Saturdays and Wednesdays, when, owing to an increased consumption in the neighbouring town of Saarbrücken, the level in the reservoir is lowered. As a result of this, negative pressure followed in the water pipes supplying the upper stories of the barrack, and this was only relieved by emptying a storage cistern under the roof, when it was found that air was sucked in and the water not replaced. The experiments showed that, under these circumstances, coloured water was actually sucked up into the water pipe through an experimental opening made into it below the supply pipe of the ground floor flush cistern, which was defective at the same time as the pan of the first floor w.c. was leaking. From enquiries made as to the movements of the first case, the date of the pollution of the water was fairly accurately ascertained, and from it the incubation period of the remaining cases calculated. This the author considers to have been from thirteen to fourteen days. The narrative is certainly instructive, and the report constitutes an excellent example of how such an enquiry should be conducted. We have not been without instances of like nature

in this country, but it is rare to find the facts and sequence of events so logically explained. It may be mentioned, incidentally, that the analysis of the clinical and pathological data of the outbreak indicates the probability of the infective agent to have been an intermediate or paratyphoid bacillus rather than the classical micro-organism of Eberth and Gaffky.

R. H. FIRTH.

A Fatal Case of Stab-Wound of the Heart.—Staff-Surgeon Stude, of Oldenburg, records a case in which he applied a suture to the wound, but without good effect (*Deutsche Militärärztliche Wochenschrift*, January, 1904). The patient, a soldier who had shown symptoms of melancholia, absented himself without obvious cause, and was found in a wood by some comrades. They endeavoured to make him return to barracks, when he tore the clothes from his chest and stabbed himself with great force in the left side. A stream of blood 10 cm. high poured from the chest, and the man became speechless and insensible. An hour and a half later a surgeon arrived with an ambulance. The man was then in a very precarious state, but able to struggle and resist being moved. A pad was applied as closely as possible to the wound. He reached the hospital one hour and three-quarters after the injury had been inflicted.

On examination, a wound, 2 cm. long, was found in the fourth intercostal space, about 1 cm. on the inner side of the left maxillary line; it took an upward direction. On removing the pad blood flowed intermittently, the amount being increased by the man's attempts to get up. The heart-sounds were scarcely audible. The pulse was thready, irregular, 80 to 120 per minute; respirations hurried, 20 to 24 per minute.

Treatment.—As the patient was evidently suffering from a stab-wound of the heart, and death from hæmorrhage was impending, the application of sutures was determined upon. Chloroform was administered so as to produce moderate narcosis. The incision proposed by Rydygier was then made, transversely above and close to the third pair of ribs and over the sternum; from the left extremity of this incision a second was made downwards and outwards over the third, fourth and fifth ribs, slightly external to the cartilages. The sternum was transversely divided with a saw. Rydygier advises that the ribs should be cut through at their junction with the cartilages; but in this case the division was made $1\frac{1}{2}$ cm. therefrom, and with a wire-saw. The flaps thus formed were dissected back, and in spite of efforts to avoid injury to the pleura, an opening was made, causing pleuro-thorax. There was a somewhat copious collection of blood, partly coagulated, between the pericardium and the chest-wall. A very good view of the parts concerned was afforded by the operation. The heart could be clearly seen, and the finger could detect the wound in the wall of the left ventricle, and its situation close to the longitudinal groove, clearly distinguishable by the accumulation of fat. It was slit-like, transverse, 1 cm. long, and situated in the upper half of the ventricle. It would easily admit the tip of the finger. The increased hæmorrhage at each contraction led to the conclusion that the wall of the heart had been completely cut through. There was no blood in the pericardium. A special suture for the latter was therefore dispensed with, and the needle was passed through both it and the substance of the heart. Owing to the violent action of the organ there was great difficulty

in applying the suture. The hæmorrhage ceased at once. During the operation a 6 per cent. lukewarm saline solution had been injected into the rectum. Shortly after the suture had been tied the heart ceased to beat for a few seconds. Then there ensued a succession of weak, irregular beats, which soon altogether ceased. The body became colder and the breathing ceased; death took place while sutures were being applied to the external wound. Attempts at restoration were useless. The operation (including preliminary preparation) occupied one hour. The man's father would not consent to an autopsy.

Stude regards the operation as justifiable, inasmuch as the hæmorrhage was going on one hour and three-quarters after the stab was inflicted. The form of incision was determined by the circumstances of the case; it was necessary to keep the pad on the wound as long as possible during the operation. Division of the sternum was very difficult, owing to the want of a proper saw. Contrary to Riedinger's statement, there was no difficulty in turning the flap over to the right. The production of pneumo-thorax was very unfortunate, but it might have been avoided had a proper saw been available. The application of the suture to the heart was rendered very difficult by the movements of the organ. A needle-holder proved useless, but with the needle held between the right thumb and forefinger, the movements of the heart could be closely followed, and the essential part of the operation was more easily accomplished. Rydygier's operation would seem to be very suitable in such cases. The excitement and struggles of the patient were more violent than is usually observed; the excess was perhaps connected with an acute attack of melancholia.

T. P. SMITH.

The Exclusion of Salt from Diet during the Administration of Iodine.—In *Le Caducée*, March 19th, 1904, Médecin-major Romany alludes to the belief prevalent among the Arabs of Algeria, that salt should be withheld from syphilitic patients under treatment with iodide of potassium. Mons. Richet and Toulouse showed, some five years ago, that if salt were excluded, comparatively small doses of the bromides would suffice for the treatment of epilepsy. Iodide of potassium is largely used by the Arabs as a remedy for syphilis, and during its administration the patients are made to abstain from salt. Other articles of food, such as spices, horse-flesh and fermented milk, are likewise forbidden.

Romany states that this plan seems to be really advisable; he has often seen much more rapid results in patients with tertiary lesions, treated by the iodide in doses of 3 grammes daily, with abstinence from salt, than in those allowed to have ordinary diet. Moreover, certain drawbacks connected with the use of iodine (*e.g.*, headache and coryza), rarely occur when salt is excluded. It remains to be seen whether further observations will confirm these statements.

T. P. SMITH.

Occasional Causes of Typhoid among Young Soldiers.—Prof. Debove has asserted (*Tribune Médicale*, 1904, No. 9) that the influence of fatigue in the causation of typhoid among young soldiers has been greatly exaggerated. Youths belonging to the middle classes and unaccustomed to physical exercise may possibly suffer from the fatigue

involved in military training; but in young peasants the previous history and capacity are of an entirely different character. He thinks that the true predisposing cause is home-sickness, coupled with the change in the feelings of a recruit, suddenly withdrawn from his family and finding himself without friends or acquaintances and subjected to severe discipline. This opinion is traversed by Dr. Grandjax in *Le Caducée*, April 2nd, 1904. He points out the conscripts have always been more liable to suffer from typhoid than the older men. As regards home-sickness and altered surroundings, the effect of any such causes has been greatly lessened by the diminution of the length of military service, by the localisation of regiments, by the increase of leave and relaxation of the severity of discipline. On the other hand, in consequence of the reduced length of service, the work during training has been greatly and necessarily increased; the result is manifested in the loss of men exempted or discharged for incapacity. As to the statement that young peasants are more capable of undergoing fatigue than youths of the middle classes, Laveran has pointed out that the sustained attention necessary during training is an important factor in the causation of fatigue. Prof. Lemoine, in discussing this question, says that if men who have led a sedentary life find physical labour difficult, the peasant will have a similar difficulty in accommodating himself to the confined life of a barrack-square. Moreover, men of the former class will sooner or later usually be benefited by the change, whereas the confinement will tell upon the peasant, who also finds his new tasks more distasteful, even if less severe, than those previously exacted from him.

M. Kelsch states that recrudescences of typhoid observed at the beginning of the year always occur at the time set apart for the training of young soldiers, and that this coincidence is not fortuitous. Epidemics are apt to break out just before general inspections, when the work is always heavy and sometimes very severe. Grandjax states in conclusion, that during his long experience as an army surgeon he has never seen an epidemic of typhoid unless the condition of the men had been previously lowered by fatigue.

T. P. SMITH.



TO THE EDITOR OF THE "JOURNAL OF THE ROYAL ARMY MEDICAL CORPS."

I am, &c.,

W. B. LEISHMAN,
Major R.A.M.C.

TO THE EDITOR OF THE "JOURNAL OF THE ROYAL ARMY MEDICAL CORPS."

OLD PRESCRIPTION.

The following is the prescription which I can now recommend :—

The reduction it will be seen is considerable, and is, I think, a very important step forward in our treatment of the disease.

I am, Sir, Yours, &c.,

F. J. LAMBKIN,
Lieutenant-Colonel R.A.M.C.

Journal
of the
Royal Army Medical Corps.

Original Communications.

THE NASAL TREATMENT OF ASTHMA.¹

By ALEXANDER FRANCIS, M.B., B.C., B.A.CANTAB., M.R.C.S.ENG
Brisbane, Queensland.

SINCE the days of Aurelian the association of asthma and nasal disease has been noticed by various writers, but it was not until Voltolini, in 1871, published 11 cases of the relief of asthma by removing nasal polypi, that any great attention was paid to the connection. Professor Hack, in 1884, brought matters to a more practical issue by endeavouring to establish an intimate relationship between asthma and nasal lesions. Following in their footsteps, many observers were able to record successful results in the treatment of asthma by nasal means, and the belief in the nasal origin of asthma gradually gained ground, until a climax was reached when Bosworth, of New York, stated, in 1886, that "a large majority of, if not at all, cases of asthma are dependent upon some obstructive lesion in the nasal cavity." In 1889 he published a list of 46 cases of asthma, of which 28 were cured and 12 improved by intranasal treatment. Of these, 17 had suffered from polypi, and the rest from hypertrophic rhinitis, deflected septum, or rhinitis with adenoid vegetations. Later he reported 86 cases of asthma, of which 42 were cured and 33 improved. About the same proportion of cures was obtained by Schmiegelow and Heyman. In

¹ Read before the Clinical Society, October 10th, 1902.

Schmiegelow's 50 cases of asthma, 32 were cured and 11 improved. But among the 32 cures, asthma recurred in 17 cases, with a recurrence of the nasal lesion. In the 53 cases treated by Heyman, 29 were cured and 14 improved. Lubinski, on the other hand, only claimed to have cured 27 and improved 13 out of 143 cases of asthma with nasal and pharyngeal lesions. Bosworth's belief that the majority of cases of asthma have some nasal lesion has been strongly combated, and the general opinion among physicians now seems to be that even in such cases where nasal trouble is found, little hope of obtaining permanent relief can be expected from nasal treatment. The most recent text-books on medicine, in dealing with the treatment of asthma, merely mention that the nasopharynx needs attention, if any gross lesion be found, but all hope of obtaining relief is placed on treatment by climates, diet and drugs. It has been further pointed out that the rhinologist is apt to be misled in his estimate of the frequency of nasal lesions in asthmatic subjects, as he is only likely to meet with such cases as have some nasal symptoms.

In the report of the proceedings of the Laryngological Society of London, May 5th, 1899, on a discussion on "Asthma in its Relation to the Upper Air Passages," which was opened by Dr. Percy Kidd and Dr. P. McBride, and in which many of the leading rhinologists took part, it can be seen that the general opinion as regards the prospect of obtaining permanent relief was anything but hopeful. Sir Felix Semon summed up the results of his experience of the nasal treatment of asthma by dividing the cases into three classes: (1) Lasting success obtained, exceedingly small percentage; (2) temporary benefit, comparatively large percentage; (3) no success at all, very large percentage: to which Dr. St. Clair Thompson suggested the addition of a fourth class, viz., those who were considerably damaged by intranasal treatment. Although some speakers took a much more hopeful view and were able to record numerous cases of successful results, still the consensus of opinion was fairly expressed by Dr. Percy Kidd when he stated that "if there was obvious disease of the nose, local treatment was advisable, though the uncertainty of the result as regards the asthma should be clearly explained to the patient."

This brings me to the point that I wish especially to deal with. No speaker suggested the advisability of treating the nose in cases of asthma where there was no obvious nasal lesion; and yet such, in my opinion, are the very cases where the most hopeful prognosis can be given. The observation that the rhinologist is likely to

see only such asthmatics as are conscious of some nasal trouble does not apply to me, because the great majority of the cases I have seen, consulted me because I was known to treat asthma and not because I practise rhinology. My experience, from treating over 400 cases of various kinds of asthma, is responsible for the opinion I have expressed, that it is those asthmatics which present no gross nasal lesions, and where there are no subjective nasal symptoms, that give the best hope of affording relief by intranasal treatment. I quite agree with the remark that one often hears, that where there are polypi or other gross nasal lesions there is a prospect of affording relief by surgical treatment, although it is necessary to explain to the patient that the relief may not be permanent and that there is a possibility that there will be no relief at all; but I maintain, and the more experience I get the more strongly do I maintain, that these are the only cases of asthma where such a poor prognosis need be given. I am fully conscious that such a statement is almost sufficient to condemn me to be no further heard; but I would submit that the record of cases that I try to lay before you justifies my belief.

Of the 402 cases here recorded, 14 only, that I know of, obtained no relief, and of these 3 suffered from polypi and 2 from such pronounced deflections of the septum that it was impossible to apply the galvano-cautery without doing operations, which were declined. Only 8 cases that presented no gross nasal lesions, out of 346 of such treated, obtained no relief, and of these 3 were only seen by me three times, and 1 four times. Of the remaining 4 cases, 1 was a confirmed morphomaniac, which may have influenced the result, and it is curious to note that in 2 of the remaining 3 cases I could at any time produce an asthmatic spasm by touching certain parts of the nasal mucous membrane, pointing to an abnormally sensitive reflex mechanism. In addition to these 14 known failures there are 17 cases where I have been able to obtain no record of the result, and a number of others that were completely relieved or greatly improved when lost sight of. This is particularly unsatisfactory, as many cases that I have at times looked upon as failures, in consequence of having lost sight of them after a few visits, months or years later I discovered had not come back to me because they had obtained complete relief. From the experience I have obtained in treating these cases I have come to the following conclusions:—

- (1) That asthma is due to reflex spasm of the bronchial tubes.
- (2) That the irritation may originate in the nose.
- (3) That asthma is not directly due to any mechanical obstruc-

tion of the nasal passages, and is not commonly caused by any gross nasal lesion.

(4) That some part of the nasal apparatus has a controlling influence upon the respiratory centre; or there is in the nose, as it were, an agency through which the afferent impulses must pass.

(1) *That asthma is due to reflex spasms of the bronchial tubes.* I feel that it would be an impertinence on my part to offer any suggestions on the pathology of asthma. The commonly accepted theory is that the dyspnoea of bronchial asthma is due to spasm of the bronchial muscles. Nearly every case that I have seen has tended not only to maintain this theory, but also to confirm my belief that the spasm is produced by reflex irritation. Also I would not make the exception of cardiac and renal asthma, which are usually distinguished from bronchial by having a pathology of their own. But I shall have occasion to refer to this later.

(2) *That the irritation may originate in the nose* is to be inferred from (1) the intimate association between hay fever and asthma; (2) the very common record of excessive sneezing at some period in the previous history of an asthmatic patient; (3) the not infrequent alternation between asthma and sneezing.

Such cases as the following demonstrate the fact more definitely. No. 391, a boy, at nine, was perfectly well until he fell on an oil-drum and broke the bridge of his nose. Asthma developed immediately afterwards, and continued in a severe form for five and a half years. Under nasal treatment he obtained instant and marked relief. In Case No. 97, the first sign of asthma dated from a horse-kick, which broke the patient's nose. When I first saw him the asthma was very severe, but was completely relieved by cauterising his septum nasi. In Case No. 309 (W. G.), severe sneezing followed an operation on his nose. This was succeeded by attacks of bronchitis and asthma on the slightest provocation. In this case the wheezing was speedily relieved by treatment, but the attacks of sneezing persisted for some time. In Case No. 4 (G. W.), an operation on the nose was also responsible for the onset of asthma. A country practitioner had occasion nine years previously to perform what he described as "amputation of the middle turbinated." Afterwards, to stop the hæmorrhage, he found it necessary to plug the nostril so tightly each day for a fortnight that extreme deflection of the septum and almost continuous asthma resulted. When I saw the patient temporary straightening of the septum at once relieved the bronchial spasm, but he declined any further surgical interference. Other cases pointing to the nasal origin of asthmatic

spasm are Nos. 143 and 177, in both of which touching the septal mucous membrane instantly induced bronchial spasm, which was as quickly relieved by painting the part with a solution of cocaine. No. 143 (T. R. S.) thus described the sensation of my touching his septum: "It felt as if you were screwing my chest up in a vice." Again, I have frequently met with cases where the patients could prognosticate an asthmatic attack by the onset of an irritation in the nose. Nos. 47 and 141 are examples. Lastly, I have not infrequently brought on a severe attack of asthma by cauterising too severely or too frequently, as one is sometimes tempted to do when patients come from a great distance and have only a short time to spare.

(3) *That asthma is not directly due to any mechanical obstruction of the nasal passages and is not commonly caused by any gross nasal lesion.* It is true that nasal polypi and other obstructive lesions of the nose are found in conjunction with asthma, but I believe the association is not so common as is generally supposed. Schmiegelow found that in 139 cases of nasal polypi only 31 had asthma, and in 517 cases of chronic rhinitis 40 had asthma. In my 402 cases of asthma 32 only had polypi, and 24 had other marked obstructive lesions. I believe that when asthma and polypi occur together they are more probably the result of some common factor than that they have any causal relationship. Of the 32 cases of asthma with nasal polypi that I have treated one only obtained complete and permanent relief, and in this case (No. 52) I did not touch the polypus. He was one of the worst asthmatics I have seen and had suffered acutely for thirty years. On his first visit to me, whither he was brought rather against his will, as he had long since lost all faith in treatment, I described him in my notes as "a perfect wreck." Finding a polypus in his nose, I felt no hope of affording him any material relief, and fearing lest I might possibly render his condition worse by removing the polypus, I contented myself with merely cauterising his septum. He returned to his home in Victoria a few days later, and three years afterwards wrote to tell me that, with the exception of a slight attack after a very long journey in Western Australia, he had remained perfectly free from asthma. I saw him last April, when he still had the polypus, but no sign whatever of asthma. In this case, evidently, the polypus was not the cause of the asthma. Again, in each of the three cases where no relief of asthma was obtained from treatment there was no recurrence of polypi after their removal, and in two of these cases (Nos. 25 and 154), in spite of the nasal

passages having been rendered free, which previously had been completely obstructed, the asthmatic spasm became intensified after the polypi were removed. I have frequently been struck by the difficulty an asthmatic patient experiences in breathing through the nose, even when there is no mechanical obstruction. Case No. 203 suffered from atrophic rhinitis, and yet complained of inability to breathe through the nose when suffering from an attack of asthma. No. 384 (Mr. B.) is a more striking example. When I first saw this patient he was suffering from severe dyspnoea and was quite unable to breathe through his nose. On examining him I found both nostrils completely obstructed by engorged turbinated bodies. On applying extract of suprarenal capsule to these bodies I rendered the passages so free that the pharyngeal vault could be easily seen through them. Still the patient felt no improvement, and characteristically sucked in his alæ nasi in his forced vain attempt to draw air through his nose. I then painted part of his septum with a drop of solution of cocaine on a pledget of cotton-wool, which did not mechanically enlarge the passage to any appreciable extent, but instantly the patient experienced the greatest relief and stated that he could now breathe quite freely through his nose. For curiosity I cauterised his septum before treating his turbinates, with the result that his dyspnoea was relieved before his nasal passages were rendered free. C. A. Parker's experiments, showing that inspired air travels through the middle rather than the inferior meatus are particularly interesting in connection with such cases, which also indicate that the nasal meati are more than mere aeroducts.

(4) *That some part of the nasal apparatus has a controlling influence upon the respiration centre, or there is in the nose, as it were, an agency through which the afferent impulses must pass.* That the nose should have the power of influencing afferent impulses to the respiratory centre is to me the most interesting phase of the whole phenomenon of asthma. If it be so, then it matters not whether the originating irritation be bronchial, gastric, cardiac, or renal, the resulting spasm can be profoundly affected by intranasal treatment. This belief has been forced upon me by the behaviour of many cases, of which the following are examples :—

No. 23 (Mr. E. A. S.) suffered constantly from asthma, although he consumed large quantities of potassium iodide. He stated that for five years he had not slept for more than two hours at a time without having recourse to smoke inhalation, and if he touched a drop of beer or ate certain foods he would be fixed to a chair for three days so closely that if his house took fire he could not move

out of it. He was indignant when I suggested looking at his nose, because he was convinced that all his trouble arose from his stomach. His nasal organ appeared quite normal, nevertheless he slept uninterruptedly for ten hours the first night after I cauterised his septum. Then, as so many asthmatics do, he sought to test the efficacy of the cure by drinking beer and eating such food as he had found in his previous experience certain to bring on an attack, but up to the present (four years) he has failed in his attempts.

No. 87 (Mr. H.) was likewise convinced that his asthma was due to indigestion, following malarial fever. He had been a terrible sufferer for nine months, during which time he had lost four stone in weight. His asthma was always worse after taking food, and particularly severe after eating certain things. He had visited each of the Australian States without obtaining relief, and when I first saw him was not able to walk many yards without resting. He derived no benefit from the first two occasions on which I cauterised his septum, but after the third burning the relief was absolute. The same day he ran to catch a train, and at the end "was not," to use his own words, "puffing enough to blow out a match." On his next visit he told me he had left all his asthma in my room and said, "It is not only miraculous, but ludicrous." Such cases are so common that I have come to look upon the remark, "All my trouble comes from my digestion," as one of the most hopeful symptoms in forming a prognosis. More striking still are the cardiac cases. No. 17 (Mr. S.) suffered from old-standing heart disease, and when I saw him was confined to his bed, but unable to lie down on account of severe dyspnœa. His wife told me that the noise of his wheezing at night disturbed the whole household. After cauterising his septum nasi his orthopnœa left him and did not return during the three months that he continued to live. No. 71, Mr. G.'s asthma appeared to be of purely cardiac origin. Although he had no cardiac murmur, the heart sounds were weak and irregular. He could make no exertion and not even walk many yards without bringing on distressing dyspnœa, which, however, was soon relieved upon his resting. After a few treatments he was able to walk uphill with ease, and the last time I saw him he walked three miles and showed no sign of breathlessness. He told me he spent most of his time now digging in his garden. Among other apparently cardiac cases are Nos. 26, 96, 112, and 159.

Many cases could be quoted in which asthma seemed to originate from irritation in the bronchial tubes or lungs themselves, but I shall merely mention one or two where the chest trouble was so

pronounced as to have given the impression that the patient suffered from phthisis. No. 6 had very severe asthma for over two years, and needed to have Himrod powder burning in the pulpit to allow him to preach. He had lost 18 lbs. in weight in ten months, and, as far as the asthmatic disturbance in his chest would allow one to tell, had the physical signs of phthisis for which he had been treated. His cough was particularly distressing, and he expectorated a large quantity of phlegm. Fifteen months previously, before I had discovered the far-reaching effect of cauterising the septum, I had removed a large septal spur from his right side without giving any relief to his dyspnœa. On cauterising his septum not only every sign of asthma but all chest trouble disappeared. I saw him again last April, five years later, when he told me he had been in the most robust health ever since, and had gained two stone in weight. No. 45 (Miss H. G.) had suffered from asthma, with signs of tubercle, including cough, hæmoptysis, and loss of weight for four months. Under nasal treatment she obtained complete relief of asthma and all chest trouble, and more than regained her lost weight. Also there are many cases where tubercle undoubtedly did exist in conjunction with asthma, in which the dyspnœa was completely relieved by cauterising the septum.

The only case that I have seen in which asthma seemed to depend directly upon renal disease was No. 180 (Mr. O.) He suffered from chronic Bright's disease, and for nine years had periodically experienced severe asthmatic attacks, which were coincident with exacerbation of his renal trouble. Under nasal treatment his asthma was very greatly relieved, and although he had other attacks later, the interval between them was much larger and they were never severe.

I should like to draw attention to some other cases which further exhibit the influence of certain parts of the nose upon the mechanism of the bronchial innervation. No. 238 (Mr. M. M.) was sent to me from the north of Queensland with a note, in which the writer doubted whether the patient would reach Brisbane alive. He was in the direst distress when brought to me, and on listening to his chest it seemed wonderful that he could keep alive on the small quantity of air that appeared to enter his lungs. His nose was apparently normal, but although the passages were very free, his painful gasps for breath were all taken through the mouth. On cauterising the right side of his septum nasi he experienced instant relief in the same side of his chest, and exclaimed, "You have loosened something here," pointing to the region of his liver. Patients have frequently complained that their tightness in

breathing was only on one side of their chest, and also frequently have I heard them state that my cauterising one side of their septum gave relief on the same side of their chest. A common expression of patients is, "You have untied something at the bottom of my ribs," and almost invariably the sensation of the cauterising is referred by them to the free border of the ribs, and not to the nose. Several times it has only been by showing a patient the length of my cautery point that I could convince him that it was impossible for me to have actually touched the spot where he felt the sensation. Still, I never had such ocular demonstration of the unilateral effect of the cautery as in this case. The right side of the chest could be seen to rise and fall, while the left appeared bound down almost motionless. So extraordinary was the effect, that I had his chest stripped again to listen. Whilst no air appeared to be entering the left lung, on the right side it was passing in freely, amidst a great chorus of crackling râles. Although the man begged me to "undo" the left side of his chest at once, I thought it better not to touch him again until the following day. When he came in the next morning he was still breathing in the same extraordinary manner. He stated that he had slept well, that the right side of his chest had continued perfectly free, but the left had been very tight and painful; this latter was similarly released by the use of the cautery, and the man remarked he could now breathe more freely than he had done for years. He remained under observation for some weeks, and in September, 1901, I received a report that he had remained well and was working on a sugar plantation.

No. 74 (Miss M.) represents another class of case. She had suffered for two years from distressing dyspnoea, especially on any exertion. Her breathlessness had been attributed to a large unilateral goitre, and she had been told that nothing but its removal could give her any relief. However, on cauterising her septum nasi the dyspnoea was completely removed, and she has ever since worked as a cook without any discomfort.

No. 345 (Mr. T. McG.) was sent to me from the country on account of a supposed growth in his throat causing dyspnoea. The latter became so severe after coughing that his friends had at times thought him dying. Finding, upon examination, that there was nothing really abnormal in his throat, I cauterised his septum nasi, with the result that his "lump" instantly disappeared and he breathed quite freely. Curiously, he developed later a wheeze which he referred to the left side of his chest, but this, too, yielded to further treatment.

Thus I have attempted to show that there is an area on the septum nasi which is intimately connected with asthma, and by treating which one is able, in the great majority of cases, to relieve all bronchial spasm. I am fully conscious that the galvano-cautery is a crude and elementary means of treating the part, and I quite believe that before long other more efficacious methods will be found. My hope is that these notes, by drawing attention to this part of the nose and its connection with asthma, will do a little towards evolving a remedy that will invariably give relief to one of the most distressing of all complaints. In the meantime, while such results as I have here recorded can be obtained by the imperfect but simple and painless galvano-cautery, we need not take the desperate view that has been expressed by an eminent authority, that the asthmatic's only hope in this world lies in potassium iodide.

SUMMARY.

Total number	402 cases.
Nose apparently normal	346 "
Polypus	32 "
Other gross lesions.. .. .	24 "
Results—	
Complete relief obtained	194 "
" " till lost sight of, or still under treatment ..	30 "
Great improvement	73 "
" " till lost sight of, or still under treatment ..	50 "
Temporary relief	20 "
Slight relief	4 "
No record	17 "
No relief	14 "
Males, 282. Females, 120.	

THE *PIROPLASMA BIGEMINUM* OF THE IMMUNE OX.

By DR. A. THEILER.

Pretoria.

I.

THE disease of cattle caused by *Piroplasma bigeminum* was first described as Texas fever. Since the discovery of Killborne and Smith, this piroplasma has been traced in several parts of the world, and the disease caused by it has been described in various countries under different names. In South Africa it is known as "redwater." At the suggestion of Lignières, the term piroplasmosis was proposed as a suitable term for all diseases due to a piroplasma. Accordingly, Texas fever was called the "bovine piroplasmosis." Up to that time only one disease of cattle due to a piroplasma was known, the one caused by *Piroplasma bigeminum*. During the last few years, however, a new malady has been traced on the East Coast of Africa and has recently been introduced into South Africa. It was then called "Rhodesian redwater"; later "Rhodesian tick fever"; and to-day it is known as "East Coast fever." The Russian investigators, Dschunkowsky and Luhs, also noticed it in Transcaucasia, and designated it as "tropical piroplasmosis." In 1897 Dr. Koch, who had remarked the disease in East Africa, believed it to be identical with Texas fever, and he thought at that time that the small and characteristic piroplasmata found in the blood were first stages of *Piroplasma bigeminum*.

After the disease had been introduced into Rhodesia and the Transvaal, it was repeatedly observed that the blood of sick animals contained the *Piroplasma bigeminum* along with the piroplasma of tropical piroplasmosis; and the opinion of Dr. Koch, which it may be said was also shared by Laveran, of the identity of these two parasites was for some time maintained. When, however, the study of the disease was undertaken in a systematic manner it was found that there were really two distinct diseases, the one due to the small piroplasma, the other to the *Piroplasma bigeminum*. The examination of many hundreds of smears taken from sick and dead cattle revealed the fact that in the majority of cases the small piroplasma was exclusively present. It was then also observed that this disease has a somewhat different course, accompanied by peculiar morbid lesions, and that cattle which are immune against Texas fever were not immune against the new malady. The main

feature was, however, that the tropical piroplasmosis could not be inoculated into susceptible cattle, even with large quantities of blood containing the small piroplasma in great numbers. This fact clearly marks the two diseases, since Texas fever is easily inoculable into susceptible cattle.

Thus, as the new piroplasma must be considered to be a species of its own, I propose to call it by the name of "*Piroplasma parvum*" (new species). This piroplasma is smaller than any of the already known species. It appears either in the form of a small sphere or as a rod (bacillary form). When stained with any of Romanowsky's methods (as, for instance, Laveran, Azur II., or MacConkey's) the sphere takes the shape of a ring; the karyosoma being visible on one side of the sphere, the margin slightly blue, and the centre usually colourless or only slightly tinged. The rod is inflated at one end, and herein lies the karyosoma. The rod-shaped parasites may be straight or curved. The rings are round, oval-shaped, or oblong, and one can also find forms which indicate intermediate stages between these rings and rods. After the death of the animal the *Piroplasma parvum* takes the ring form.

These parasites are found towards the end of the disease in enormous numbers, investing from 30 per cent. to 90 per cent. of all red corpuscles, and several may be counted in the same blood cell.

The presence of *Piroplasma bigeminum* together with *Piroplasma parvum* is probably due to the breaking down of immunity against redwater through the influence of the *Piroplasma parvum*. It is a well-known fact that any animal which has recovered from an attack of Texas fever must contain the *Piroplasma bigeminum* in its blood. This fact can be easily demonstrated by injecting such blood into a susceptible animal. Cattle known to be immune against redwater are often observed to suffer a second time from this disease when weakened through adverse circumstances. This is often the case when the animal has contracted some febrile disease, as, for instance, rinderpest. I have purposely dwelt on the description of the *Piroplasma parvum* of tropical piroplasmosis, since its size, form and shape are so typical that their presence permits the diagnosis of the disease.

II.

The *Piroplasma bigeminum* is so well known that a description is merely superfluous. It is found in all cases of redwater during the fever stage and disappears afterwards. It also occurs in the

blood of a recovered animal, although its form and shape have not hitherto been described. The strongest proof that the piroplasma is present in the blood of immune oxen is to inject such blood into young calves, when the typical piroplasma reappears, causing a reaction. This experiment has been made use of as a method of preventive inoculation, since it has been noticed that the reaction does not, as a rule, cause death, but produces immunity. For some time it has been known that after the first reaction, in some animals at least, a second occurs which may even prove fatal, and that during this reaction the *Piroplasma bigeminum* reappears. Afterwards immunity is established. In an immune ox the usual form of *Piroplasma bigeminum* may occasionally be found. If, however, the typical piroplasma, in its usual pear shape, is thought to be present in every immune ox, then the organism must be so rare as to escape microscopical examination. It is also believed that the parasite may change to some other state, in which it remains dormant.

III.

When the examination of the blood of a calf which has been injected with blood from an ox immune against redwater is made and is continued after the second reaction has taken place, then a peculiar phenomenon is observed, namely, the occurrence of endoglobular parasites which correspond to the description of *Piroplasma parvum*. Sometimes they infest a considerable number of red corpuscles, but never as many as in cases of tropical piroplasmiasis of some duration. Nevertheless, the microscope reveals a picture resembling that found in East Coast fever at the early stage of the disease, so that an error, unfortunately, is more than likely. We have observed rings and rods (bacillary forms) as described above, and similar in size and shape. In some instances these organisms are already present during the second reaction after the inoculation of redwater-immune blood. Usually, however, they appear after the second reaction is over, and sometimes along with *Piroplasma bigeminum* in its typical shape. Increasing for the first few days, they may in exceptional cases infest about 10 per cent. of red corpuscles, decreasing gradually. Some calves show them in varying numbers, for the first few months one to two in each microscopical field, but the decrease is maintained, so that after several months they have become so rare that it needs much patient searching and successful staining to find them. These parasites are still found in the blood of animals even after the lapse of a year.

In several cases the appearance of these organisms is preceded or accompanied by poikilocytosis of the red corpuscles, by the formation of basophile granulations and nucleated red cells. The basophile granulations are either uniformly distributed in the blood cells, and may be of different size, or appear only as a single dot, nearly always on the margin of the blood corpuscle. These granules cannot be mistaken for the above-mentioned organisms, since they are of a uniform dark blue when stained with methylene blue, and contain neither a chromatic body nor an achromatic zone. What I have described as endoglobular organisms are undoubtedly of a protozoal nature, inasmuch as they take the distinctive stain of piroplasma.

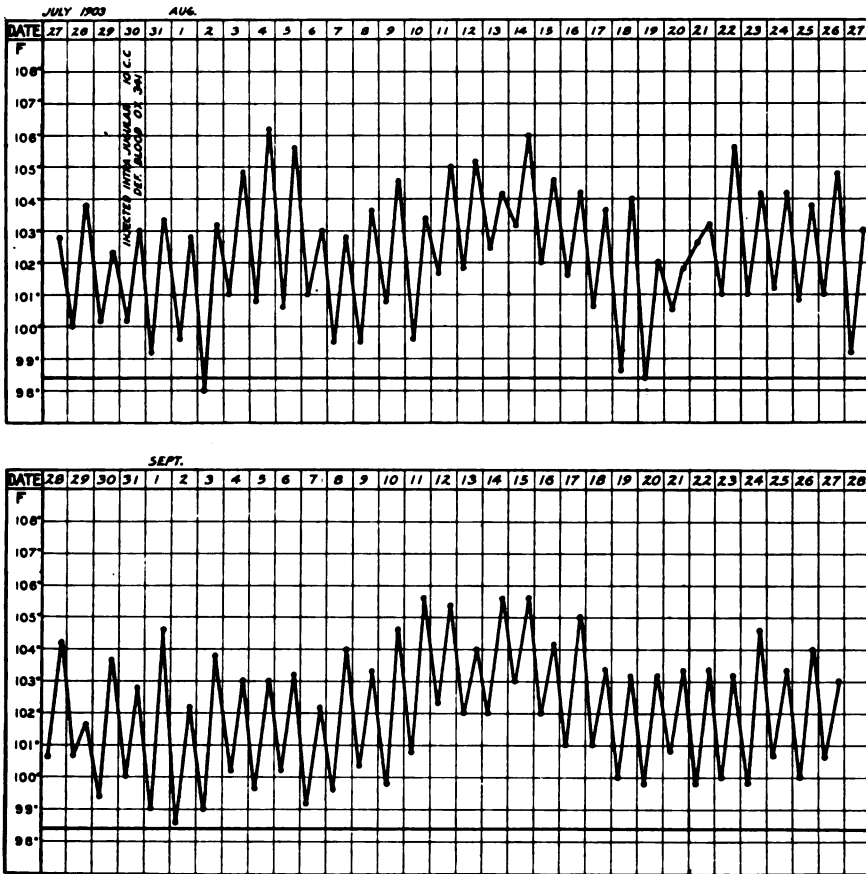
IV.

I consider these organisms as the type of *Piroplasma bigeminum* in the immune ox, which when injected into fresh susceptible animals reappear in the form of the pear-shaped parasites. This immune form has nothing to do with *Piroplasma parvum*, with which it is often easily mistaken. The following experiments will support this view :—

Experiment 1.—Ox VI., about 2 years old, born in Aliwal North, Cape Colony, from where it was imported, a district where no red-water is known. It was tied up in our station and never left outside the premises. On July 30th, 1903, it was injected with 10 cc. defibrinated blood of Ox No. 347, which had contracted ordinary redwater towards the beginning of November, 1902. Already on the fourth day after injection the temperature began to rise in Ox VI., reaching on the fifth day 106·2° F. On the next day the typical *Piroplasma bigeminum* was present in rather large numbers. On August 9th, 1903, red urine was voided for the first time; on August 13th *Piroplasma bigeminum* was still present, but the urine cleared up. On August 14th the first basophile granulated red corpuscles appeared, they increased during the next few days and a marked poikilocytosis made its appearance. On August 16th *Piroplasma bigeminum* was rare; the temperature was then 104·2° F. in the evening. A week later the basic granulations were still noticed. On September 9th, 1903, a second reaction set in, which lasted about eight days, and the evening temperature rose as high as 105·8° F. On September 12th, 1903, the blood was examined and small endoglobular organisms resembling *P. parvum* were found in the red corpuscles. The basic cells reappeared the following day. The parasites increased during the subsequent days, poikilocytosis

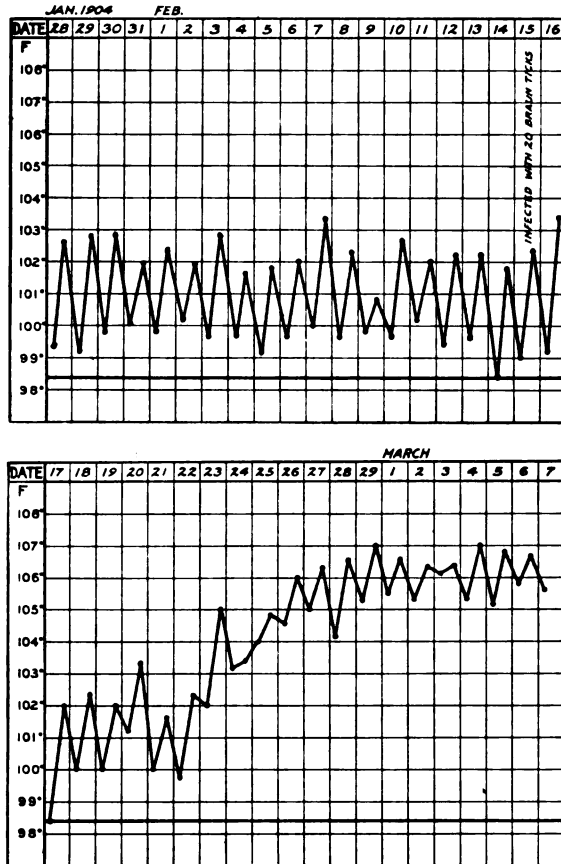
and nucleated corpuscles also appeared. On September 15th the parasites were in such numbers that the presence of tropical piroplasmiasis was suspected, and the count revealed an infection of 10 per cent. of all corpuscles. On the 17th the number began to decrease, the basic cells being still abundant. Finally they almost entirely vanished; but whenever at any later date the blood was examined they were found. During the second reaction nothing appeared amiss with the ox.

The following chart shows the temperature curve of Ox VI. after inoculation with redwater blood. Note the two reactions.



There was, nevertheless, some doubt in mind that the ox had contracted the tropical piroplasmiasis, although I was unable to explain where the infection could have come from. It should be

stated here that an animal which has recovered from East Coast fever is immune. I have tested such animals on badly infected ground for over a year. This demonstrates their complete immunity. We may, therefore, conclude that when we are able to give Ox VI. the East Coast fever in the natural way, that is, by tick infection, that the reaction in which the small piroplasma was found had



nothing to do with East Coast fever. On February 15th, 1904, the blood of this ox was examined and the typical rings were still found present in small numbers. On this date the ox was infested with twenty ♀ and ♂ of the tick *Rhipicephalus appendiculatus* (Neumann). These ticks had been feeding as nymphæ on an ox suffering from East Coast fever. The same brood of ticks had already produced the disease in three other oxen. On February 23rd, 1904, the tem-

perature of Ox VI. began to rise, and kept up during the next thirteen days, and on March 7th Ox VI. died of tropical piroplasmosis. The *Piroplasma parvum* was present in large numbers.

The preceding chart shows the infection of Ox VI. with East Coast fever by means of ticks. (See p. 474.)

Thus I conclude that the two reactions in which the small endoglobular parasites were seen had nothing to do with one another; and that *Piroplasma parvum*, although resembling in form and size the endoglobular parasite found in the second reaction of Ox VI., is altogether a different species.

V.

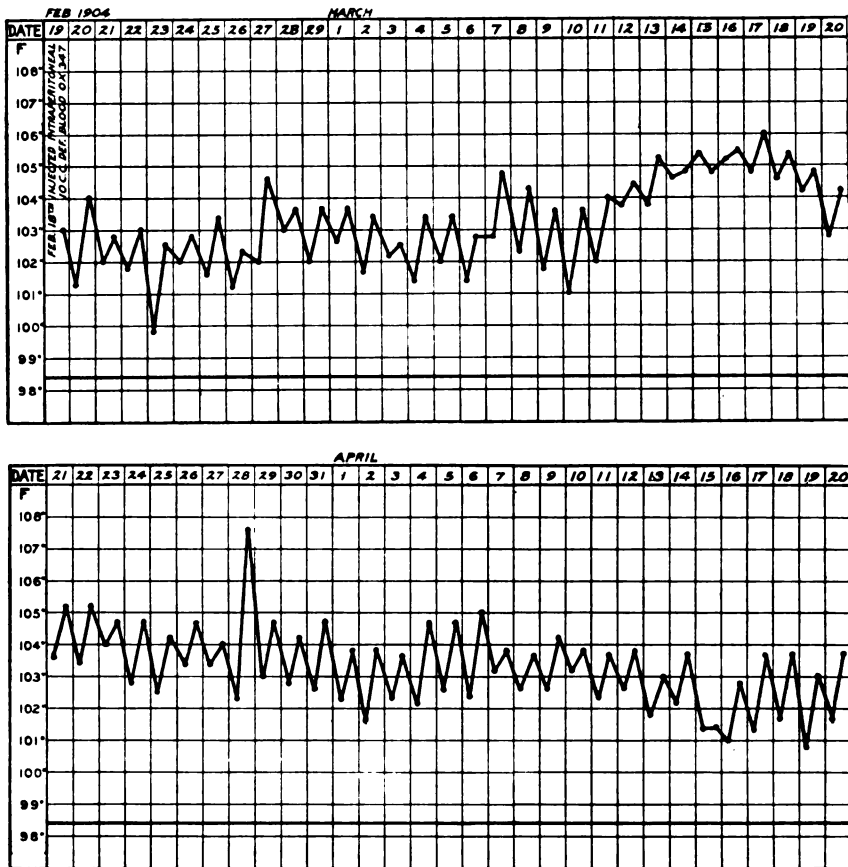
If what I describe as the immune form of *Piroplasma bigeminum* is really only found after redwater reaction, then it follows that it will not be found in animals which are susceptible to this disease. This point can easily be settled by examining blood of freshly imported cattle from England, and of calves which are born in stables in the Transvaal. Such cattle, when injected with blood from an immune ox, should naturally show the appearance of rings and bacillary piroplasmata.

Experiment 2.—Calves 240 and 241 were both born on the premises of the laboratory; they were, at the time in question, still sucking, and there was no chance that they had previously contracted tick infection. Their blood was repeatedly examined, and found to be free of any endoglobular parasites. On February 18th, 1904, the blood of the redwater-immune Ox 347 was examined, and the typical rings were found to be present in small numbers. The ox was bled, and the defibrinated blood was injected into the calves. Calf 240 was injected intraperitoneally, and Calf 241 subcutaneously, with 10 cc. defibrinated blood.

Calf 240.—The blood, which, after the injection, was daily examined, showed *Piroplasma bigeminum* for the first time on February 24th. There was no rise of temperature. The next day the parasites were still present, also on the 26th, 27th, and 28th. On the last date a slight elevation of the morning temperature began, but there was never any distinct reaction. On March 1st the blood was found to be free of parasites. From March 11th a reaction began, during which the temperature rose considerably, reaching 106° F. on March 17th. From March 13th onwards the marginal basic points were now noticed in the red corpuscles; poikilocytosis and basophile red corpuscles appeared, and were present on March 23rd, when *Piroplasma bigeminum* was again visible. From that

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date (March 23rd, 1904) onwards a few rings and bacillary forms were noticed; they were present the next day, and on the 28th had considerably increased. The *Piroplasma bigeminum* was still found in preparations dated March 26th and 27th. The following days the rings still increased, and on April 7th they were so numerous that the microscopic field resembled an infection due to *Piroplasma*



parvum at the beginning of East Coast fever. There were sometimes two and three rings and rods in one corpuscle. A decrease took place from April 13th, 1903. A daily examination was continued up to June 1st, 1904, when rings and bacillary forms were constantly found.

The above chart shows the temperature curve of Calf 240.

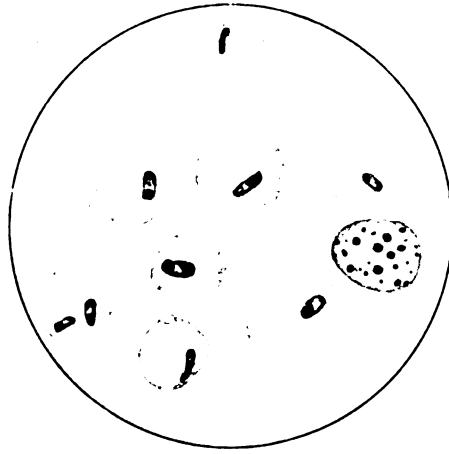


FIG. 1.

Piroplasma bigeminum. Rings and bacillary forms found in the blood of immune oxen (Ox 241). See page 477.

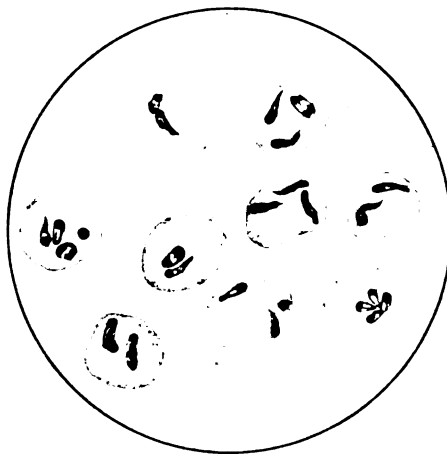
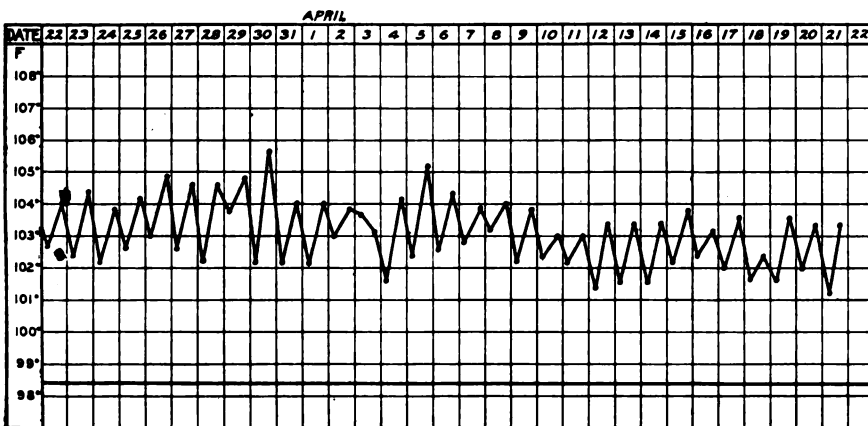
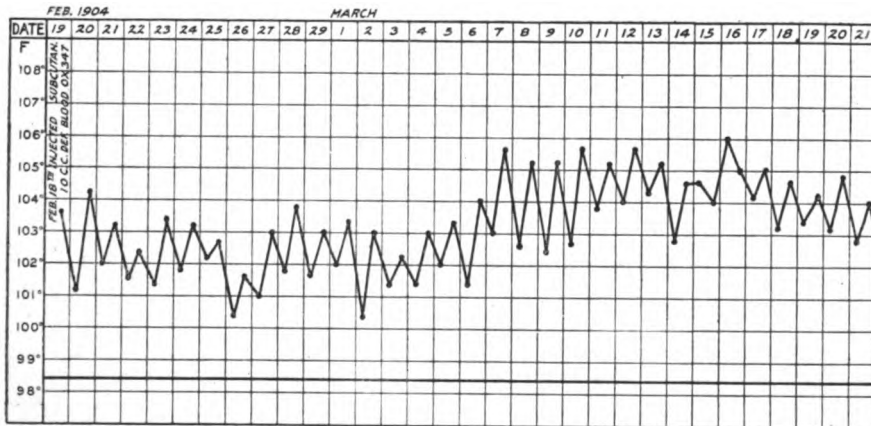


FIG. 2.

Piroplasma parvum in the red blood corpuscles of an ox suffering from a severe attack of East Coast fever.

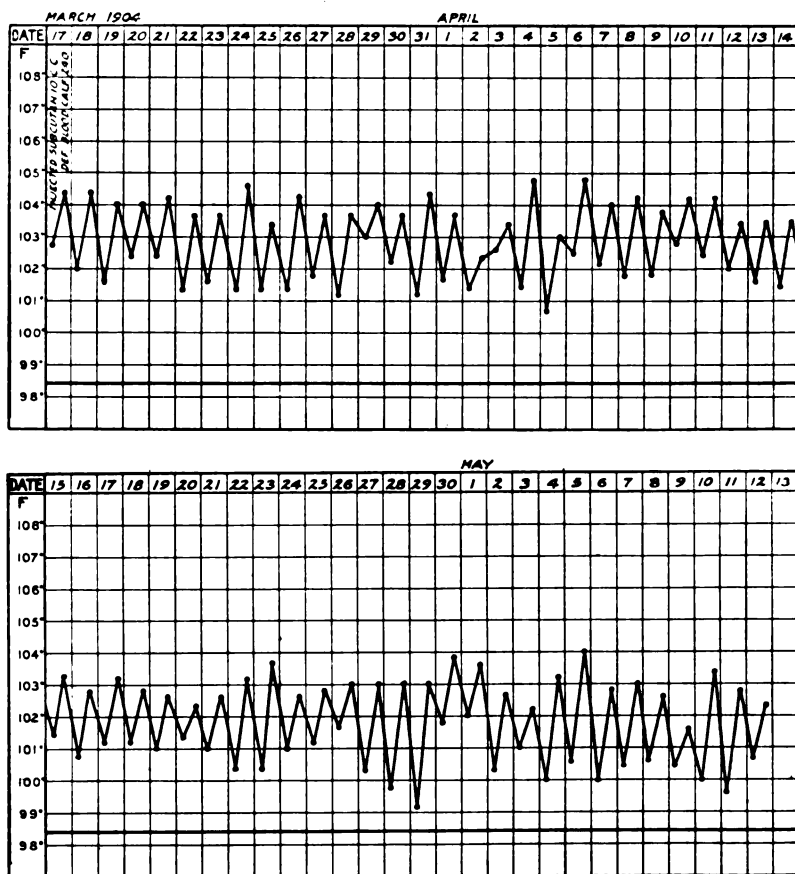
Calf 241.—The temperature of this calf began to rise on March 7th. On March 13th there was a distinct poikilocytosis present, a few basophile red corpuscles, and also the basic marginal points, and these were daily noticed up to March 26th. On March 21st *Piroplasma bigeminum* appeared, and the first bacillary forms and rings were noticed. (Fig. 1.) After the 26th the rings were somewhat frequent during the days following. On April 13th basophile cells were still present. The decrease of rings began about April 13th. The blood of the animal was also daily examined during the next months, and up to the present time the rings are still present in small numbers.

Temperature chart of Calf 241 :—



VI.

When Calf 243 came into a second reaction I deemed it advisable to test whether the blood of this reaction would produce the same effect as the immune blood. Accordingly two calves, Nos. 242 and 243, were injected. These calves were also born on the premises. They served as controls for Nos. 240 and 241, and during this



time never showed any endoglobular organisms. Both calves were injected with 10 cc. defibrinated blood under the skin on March 17th, 1904.

Experiment 3.—Calf 242. On March 29th, 1904, the first *Piroplasma bigeminum* was noticed. There was no distinct temperature reaction. The parasites were seen again on April 3rd, from which

date an irregular course of temperature began. On April 17th the *Piroplasma bigeminum* was again found. On the 18th a few basophile marginal points were noticed in red corpuscles, and on the 19th the ring forms were already present. On April 21st rings and bacillary forms were seen in fair numbers. There were basophile granulations in red corpuscles. On April 25th basophile cells were still present, so also were the *Piroplasma bigeminum* and the rings and bacillary forms. The *Piroplasma bigeminum* disappeared again, the number of red cells with basophile granulations became reduced, and the rings remained in moderate numbers on the date of writing (June 1st, 1904).

Chart showing temperature curve of Calf 242. (See p. 478.)

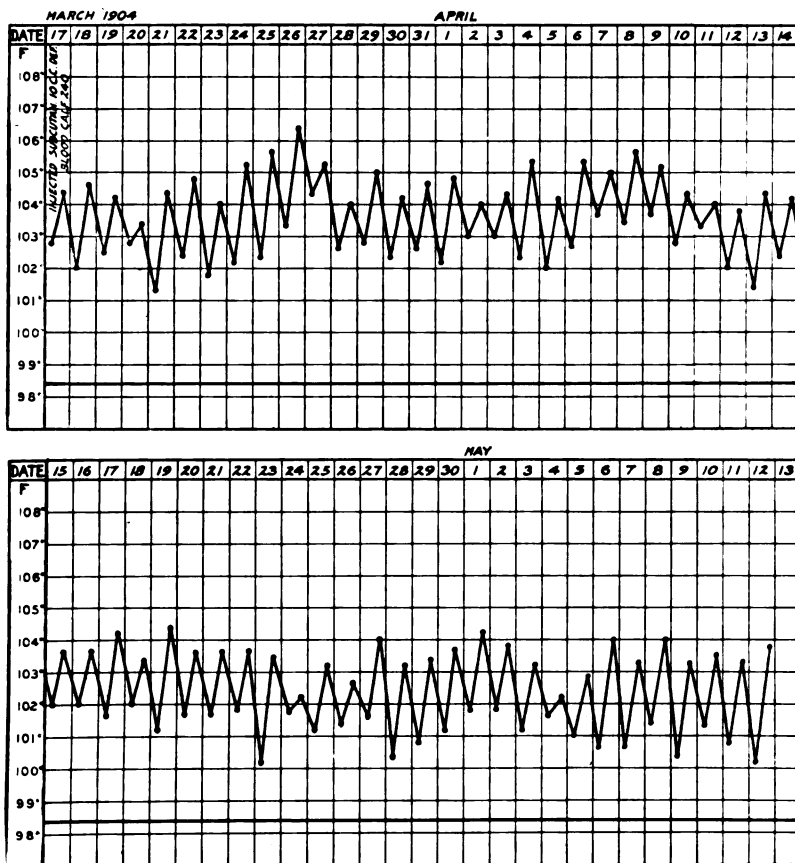


Chart showing temperature curve of Calf 243.

Calf 243.—From the sixth day after the injection of the blood a distinct reaction set in, lasting about seven days. The *Piroplasma*

bigeminum was observed on March 26th, when the temperature reached 106.4° F. On March 25th, 1904, poikilocytosis made its appearance, the *Piroplasma bigeminum* was present during the next five days, and then gradually disappeared. The poikilocytosis was noticeable during that time. On April 19th the poikilocytosis was again noticed, and also were the marginal points and the basophile granulations. The *Piroplasma bigeminum* appeared on April 20th for the second time. The rings and bacillary forms appeared on the 26th, on which date a few basic cells were still noticed. After that date the bacillary forms and rings were continually found in the blood, but in gradually decreasing numbers.

VII.

The above experiments were made for the purpose of ascertaining whether after an inoculation of immune redwater blood the appearance of rings and bacillary forms is a necessary result. From various casual experiments made at a previous date, when the true nature of these rings was not yet apparent, I remarked endoglobular parasites identical with those just described, although in the latter case the examination of blood was not carried out from the very beginning. The oxen used in this experiment all came from Aliwal North, a country free of redwater. The idea of the experiment was to ascertain whether the blood of an immune Redwater ox, mixed with serum of a hyperimmunised ox simultaneously injected, or serum injected before virus, or virus injected before serum, modifies in any way the reaction due to the immune redwater blood.

Experiments.

December 3rd, 1903.

Blood.			
Subcutaneous	..	Ox 229	} 100 cc. serum ; 5 cc. blood simultaneously.
Intrajugular	..	Ox 230	
Blood.			
Subcutaneous	..	Ox 233	} 5 cc. blood c. ; 24 hrs. later 100 cc. serum.
Intrajugular	..	Ox 228	
Blood.			
Subcutaneous	..	Ox 227	} 100 cc. serum c. ; 24 hrs. later 5 cc. blood.
Intrajugular	..	Ox 226	
Blood.			
Subcutaneous	..	Ox 211	} Mixture of 100 cc. serum and 5 cc. blood 24 hrs. old.
Intrajugular	..	Ox 225	
Blood.			
Subcutaneous	..	Ox 232	} Controls 5 cc. blood.
Intrajugular	..	Ox 231	

The result was that the serum had no influence on *Piroplasma bigeminum*, inasmuch as the controls behaved exactly as the serum-

treated animals. In some of the animals a disturbance of the temperature was noticed similar to that in ordinary redwater, whilst others showed no reaction.

Result of Inoculation and Microscopical Examination.

No. 229.—A slight primary and distinct secondary reaction was present. The blood was examined on February 25th, 1904, and small rings were present.

No. 230.—No distinct reaction took place. The animal was used on January 23rd, 1904, for a heartwater experiment, and died on February 14th. Nothing could be found in the blood of the dead animal.

No. 233.—This ox had a primary reaction with high evening temperature. A secondary reaction was not so distinct, the morning temperature being somewhat higher. The animal was also used for a heartwater experiment and inoculated on January 12th, 1904. It died on January 20th from heartwater. An examination of the blood during the reaction revealed the presence of poikilocytosis, basophile granulations in the red corpuscles, marginal basic dots; bacillary forms and ring forms were seen in rather large numbers, sometimes two and three endoparasites in the same corpuscle.

No. 228.—No distinct primary reaction was noticeable, but a secondary reaction lasted for some time. On February 23rd, 1904, the blood was examined, when numerous small rings and also bacillary forms of endoglobular parasites were noticed.

No. 227.—A primary reaction was noticeable. There was no distinct secondary reaction. Small parasites were seen on February 23rd, 1904.

No. 226.—The inoculation of blood was followed by an irregular course of temperature. No distinct primary or secondary reaction was noticeable. The blood examined on February 25th, 1904, showed a few rings present.

No. 211.—No reaction took place. There was no examination.

No. 225.—A very irregular reaction took place, which could be differentiated into a primary and secondary one. Rings were also found on February 25th, 1904.

No. 232.—No disturbance of temperature took place. Rings were noticed on February 25th, 1904.

No. 231.—A slightly primary reaction and a distinct secondary reaction. On February 17th, 1904, the examination of blood gave negative results.

The result of the inoculation was the appearance of rings and bacillary forms in the majority of the animals. We are justified

in concluding from the above experiments that the appearance of rings was due to the injection of immune redwater blood, the serum having had no effect whatever, the blood giving rise to reactions such as are usually observed in redwater inoculations. The examination of the blood was in some animals negative, which is not to say that the parasites were entirely absent, but merely that they escaped observation.

VIII.

In addition to the evidence brought forward under the foregoing paragraphs, I am able to quote additional and similar experiments. Eighteen imported English thoroughbred heifers, belonging to the Hereford, Shorthorn, Jersey, Lincoln, Polled Angus and Aberdeen Angus breeds, were inoculated against redwater; two on September 10th, four on October 24th, ten on November 14th, 1903. With the exception of two, all had reactions; most of them had primary reactions, during which time the *Piroplasma bigeminum* was noticed; while in the majority of the heifers, poikilocytosis and basophile granulations of the red corpuscles were observed. Four of the animals died, two from the primary reaction and two from the secondary reaction. Some weeks after the reaction the blood of the animals was again examined and in all of them rings were found. At the same time the blood of ten imported animals of the same breeds which were never injected, but had served as controls, was examined and gave negative results.

IX.

Finally, I was able to trace the rings and also bacillary forms in cattle which at one time or another had been injected with blood from other animals.

Calf 239 was born on the place. It was injected on December 28th, 1903, with the blood of an animal (Ox 491) which some weeks previously had the *Trypanosoma theileri* in its blood. The object was to ascertain whether the trypanosoma was still present in the ox.

The Ox 491 was immune against South African redwater. The result was the calf showed a primary reaction; the secondary reaction was indicated by an irregular course of temperature. Since February, 1904, the blood has been daily examined and rings and bacillary forms were found in every preparation up to the present date.

Calf 198, Africander heifer, was injected on May 13th, 1903, with 50 cc. blood taken from a redwater immune Queensland heifer suffering from some unknown disease. There was some disturbance of the temperature in the injected calf, but the diagnosis was not satisfactory. It was later immunised against rinderpest by the simultaneous method. On August 21st, 1903, it was again injected with blood from an animal which had *Trypanosoma theileri* in its blood. Again a disturbance ensued, but no trypanosomes were seen. On February 25th, 1904, a careful examination of the blood was made, when rings could be found.

Calf 212, on October 5th, 1903, injected with blood of Ox 490, which contained *Trypanosoma theileri*. The calf proved to be immune against trypanosoma, but nevertheless a well-marked primary and also a distinct secondary reaction were noticeable. On October 22nd, 1903, a very marked poikilocytosis, basophile granulations and marginal basic point were registered, which were visible for some time. No further notice was taken of the animal until February 17th, 1904, when the ring forms of *Piroplasma bigeminum* were found. Since it was evident that the rings and bacillary forms were a necessary result from the previous inoculation with redwater-immune blood, it was further concluded that these rings would be found in most oxen which at one time or another had been injected with the blood of immune cattle. At the rinderpest serum station, which was under my charge, there were about 200 oxen, all of which were hyperimmunised against rinderpest. They had all received at least 4,000 cc. rinderpest virulent blood. This blood was taken from sick cattle, and as most of the cattle had been born and bred in redwater areas, it naturally followed that through the injection of rinderpest blood the immunised cattle also became highly immunised against redwater. Indeed, the *Piroplasma bigeminum* was repeatedly noticed in inoculated cattle which went through a rinderpest reaction. A microscopical investigation of twenty head was made at repeated intervals, when, in almost every instance, rings and bacillary forms were met with at one time or another.

X.

I have observed that the rings and bacillary forms multiply in an immune animal when it is placed under adverse circumstances, as, for instance, when it is attacked by some other disease.

Calf 200, an Africander heifer.—This animal was immunised against rinderpest on June 26th, 1903. It went through the

usual rinderpest reaction. On July 24th it was used for a heartwater experiment and injected with 10 cc. blood of Goat 62, suffering from heartwater. The heifer reacted on August 10th. On August 13th the blood was examined, when ring-shaped and rod-shaped endoglobular parasites were noticed, resembling in every respect the *Piroplasma parvum*. They decreased within the next few days, and when the heartwater reaction was over, on August 16th, these parasites had become very rare. That this reaction was nothing else than pure heartwater was proved by the fact of the inoculation of blood into sheep and goats which died from typical heartwater, and, further, that the endoglobular parasites were missing in these animals. The micro-organism of heartwater is not known. When a search for ring forms in Calf 200 was made at a later date (December, 1903) they were always found and in comparatively large numbers.

Calf 187, Somali.—This animal was injected with serum on April 11th, 1903. There was no virus used, but a disturbance of temperature was noticed afterwards, and during this reaction basophile red corpuscles were observed. In my opinion, the cause of this must have been due to a natural infection with redwater, from which the animal had suffered before it came under my care. Later (June 26th, 1903) it was immunised against rinderpest by the simultaneous method, when a rinderpest reaction was seen. On July 27th an injection with heartwater blood of Goat 60 was made. A slight reaction followed, during which the ring and rod-shaped endoglobular parasites were seen. On February 25th, 1904, the blood was examined and the rings were still found to be present in fair numbers.

Ox 484.—This was an ox hyperimmunised against rinderpest. It was running on the pasture behind Magaliesberg. On December 12th, 1903, it was noticed to be ill, not feeding, and losing condition. Its temperature was high. An examination of the blood was made and numerous small piroplasmata were present, so that the diagnosis was rather doubtful. An inoculation of blood was immediately made into other cattle and also into sheep, when it was found that the disease was heartwater. The small parasites soon disappeared and the ox recovered. A repeated examination was made of its blood, and up to the present time the rings are present in fair numbers. Also in this case the sheep did not show any parasites.

XI.

The foregoing notes indicate that the presence of ring-shaped and rod-shaped endoglobular parasites is due to a previous infection of ordinary redwater. Seeing that cattle suffering from tropical piroplasmosis only recover to the extent of 5 per cent., the thought that East Coast fever was complicating the foregoing experiments must be excluded. In addition to this, the case of the first-mentioned ox (No. 6) has clearly demonstrated that when small rings and bacillary forms have once been present in rather large numbers (10 per cent.), such an animal, when exposed to tick infection, will succumb, since it has not acquired any immunity against tropical piroplasmosis; neither does the presence of rings in the blood of animals indicate that immunity must be expected against East Coast fever.

The ring-shaped and bacillary-shaped piroplasmata have been overlooked hitherto in connection with ordinary redwater. That may be attributed to the fact that the examination of blood of animals suffering from ordinary redwater has not been continued long enough, but also to the fact that the parasites stained with ordinary aniline dyes are not easily recognised as such, and, finally, because in the majority of cases they are so rare that they are easily overlooked. I have previously pointed out the typical stains for protozoa, such as Romanowsky's modification, are necessary in order to recognise the chromatic nucleus, which removes all doubt as to the true nature of the endoglobular parasite.

XII.

The ring-shaped and bacillary-shaped piroplasmata in immune cattle are considered by Professor Koch to be identical with what I have termed the *Piroplasma parvum* of tropical piroplasmosis. He has also observed that the inoculation of blood taken from a sick animal suffering from tropical piroplasmosis does not produce the disease in the new animal. When, however, the inoculation is repeated, the appearance of the usual small parasites in the blood is noticed in some of the animals; and he concludes that, under certain conditions, the organisms of East Coast fever may multiply and undergo reproduction in the blood of the injected animal, notwithstanding that there is no reaction. Furthermore, he states: "Other experiments have also shown that inoculations with the blood of recovered animals, which only contains an inconsiderable number of single parasites, will induce similar modified attacks of

African Coast fever, and while these experiments have not been numerous, they tend to indicate that recovered animals are even more suitable for inoculation purposes than those which are actually sick."

At different intervals I have injected animals immune against South African redwater with virulent blood of tropical piroplasmosis, and also with blood of animals immune against this disease, in quantities up to 2,000 cc. at a time. After intervals of varying duration these animals were exposed to natural infection, when they all, with only one exception, contracted the disease and died. The injection of blood from an animal suffering from tropical piroplasmosis into another one may, indeed, cause the rise of the temperature, and very often after the reaction basic points and basophile red corpuscles are noticed, together with the appearance of rings and bacillary piroplasma. Of five Texas calves which were injected on November 24th, 1903, with quantities of 10, 50, 100, 500 and 1,000 cc. virulent blood (East Coast fever blood), all showed reaction due to the injection. The inoculated blood was derived from another Texas calf whose blood was swarming with the *Piroplasma parvum*. The animals were later examined for rings, when it was found that the bacillary and ring-shaped piroplasmata were present; and in the animals alive to-day they are still found. The calf which was injected with 1,000 cc. virulent blood was infected on February 8th, 1904, with only two pathogenic ticks (one ♀ and one ♂ *Rhipicephalus appendiculatus*). It contracted the tropical piroplasmosis, and after an illness of thirteen days died from the disease. In this case it is uncertain whether the rings were not already present before the injection, no previous examination having been made of the blood. The appearance may be attributed to the injection of virulent blood; but whatever the cause of these rings, I am forced to the conclusion that their presence does not indicate the immunity of the animal against *Piroplasma parvum*.

When we analyse the experiments made by injection with tropical piroplasmosis blood or blood of the immune animal, it becomes evident that with the *Piroplasma parvum* we also inject the organisms of ordinary redwater in its immune form. All animals which have hitherto recovered from tropical piroplasmosis are immune against redwater. East Coast fever has only so far been observed in redwater countries. The increase of rings and bacillary forms of *Piroplasma bigeminum* may be a result of such injections, even when an animal is already immune against redwater.

XIII.

Since January 19th, 1904, fourteen oxen are undergoing treatment according to Professor Koch's method of inoculation. They have already been injected thirteen times with blood of animals recovered from tropical piroplasmosis: two of the immune oxen showed the rings in their blood, one had none. The East Coast fever immune animals were treated as to their immunity by exposing them in infected areas for a long period. The fourteen oxen were previously used for the reproduction of rinderpest serum and had been injected to the extent of 4,000 cc. virulent rinderpest blood. They were injected the first time on January 19th. The second injection was made a week later, and on this occasion their blood was examined, and in all animals, except two, the rings were noticed. The inoculation of blood brought no reaction on the animals through their repeated rinderpest hyperimmunisation, also hyperimmunised against redwater, and accordingly the subsequent inoculation of small quantities of blood (10 cc.) had no effect. Their blood was examined weekly for ring-shaped and bacillary piroplasmata, which were found, without exception, in all animals during the period of five months, but always in very small numbers, and at no time was a distinct increase observed. It must be concluded that in these animals the ring-shaped and bacillary piroplasmata were due to the rinderpest blood injections, and not to the inoculation with recovered blood of tropical piroplasmosis.

It is intended to expose the cattle to natural infection after having been treated according to Koch's method. After five months of such treatment they are expected to prove immune against East Coast fever. The question of immunity due to inoculation has, however, since been settled in Rhodesia, where about 5,000 head of cattle have been inoculated. Mr. Gray, Principal Veterinary Surgeon, at the last Congress of Veterinary Surgeons, held on May 25th, 1904, in Cape Town, made the statement that cattle inoculated according to Koch died of East Coast fever, just as cattle did which were never inoculated. The Congress passed, therefore, the following resolution:—

“That this Conference, after considering the reports of the experts who have had practical experience of the effects of inoculation as proposed by Dr. Koch, is reluctantly compelled to the conclusion that it will be vain to trust to inoculation to arrest the spread of African Coast fever.”

CONCLUSIONS.

(1) The injection of blood into a susceptible animal, taken from an ox immune against ordinary redwater or Texas fever, usually gives rise to a primary and a secondary reaction, during which period the typical pear-shaped *Piroplasma bigeminum* makes its appearance.

(2) Either with the second reaction or shortly afterwards endoglobular parasites appear in the shape of rings and rods, which resemble the *Piroplasma parvum* of East Coast fever.

(3) These rings and rods are seen in the majority of all cattle living in a redwater infected area and which at one time or another have been injected with blood of cattle immune against redwater.

(4) The presence of the rings and rods in the blood of an ox proves immunity against redwater.

(5) When rings are observed in cattle injected with blood of cattle suffering from or immune against East Coast fever, then they are due to the simultaneous injection of immune blood of ordinary redwater. At the present time East Coast fever exists only in redwater infected areas, where the cattle are immune against redwater.

(6) The presence of rings does not indicate that an animal is immune against East Coast fever.

(7) The rings and rods may, under certain conditions, multiply and increase in numbers.

(8) The rings and rods represent a phase in the life-history of *Piroplasma bigeminum* in the immune ox.

NOTES ON THE SUDANESE TRIBES OF THE WHITE NILE.

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THE Sudan, a word derived from the Arabic root, "Soöd," to blacken, was the name given by slave-dealing Arabs to their happy hunting ground along the White Nile and into Equatorial Africa; the land of the black people.

Under a geographical nomenclature, a number of Arab tribes might now be called Sudanese, since they are inhabitants of the Sudan. In this article only those tribes are so called that, dwelling in the Sudan, are free from all trace of recent Arab blood. The material to be dealt with, even thus limited, is immense, and only the very general ignorance that exists on the subject gives me courage to attempt it. It is, indeed, surprising that, seeing how deeply concerned we are in the development of the country, many English people know so little about it, and that the number of educated men capable of naming a single Sudanese tribe is insignificant. The number of pure Sudanese tribes left, after the Arabs have been eliminated, is very great. They differ from each other in appearance, in language, in occupation, and largely also in customs, though many customs are common to widely differing tribes, as one would expect, seeing that similar conditions and necessities tend to be met similarly by primitive peoples.

Even within the unit of the tribe itself there are sub-divisions, distinguished not so much by a divergence in customs as by the artificial barriers of old feuds and quarrels; by envy, hatred, and malice, and all uncharitableness. An observer cannot fail to be struck by the marvellous permanence and tenacity of tribal types, seeing how small, numerically, such units are, how greatly to their interest union with their neighbours would be; and, above all, seeing that marriage is not entirely limited to the tribe, but may bring in new blood either by capture or, in some instances, by purchase. And yet these little tribes continue to exist, each with its own language, traditions, and physical appearances, its customs and, in short, its individuality.

In strong contrast with this tendency of tribes to isolation and independence is the wonderful *fusibility* of individuals where placed under new conditions. This fusibility or adaptability is constantly

to be observed in the Sudanese battalions of the Egyptian Army. Here one finds Dinkas and Shilluks cheek by jowl with Bertas from the East, Nubas from the West, and Niam-Niams from the remote South, all living together under similar conditions; all, whether originally cannibals or cattle-men, eating a soldier's ration with great content; all proud of their uniform and exceedingly smart in their "turn-out," although the traditions of many of them declare garments unworthy of the warrior; and, finally, all equally engulfed by the irresistible flood of Islam.

Here, indeed, is a partial explanation of their fusibility. No individuality can resist the solvent action of Mohammedanism, a faith that devours the ideas of primitive peoples as locusts devastate a garden-patch; and that leaves behind nothing but a dull conformity with social and religious rules. The Sudanese in a battalion might easily be thought to belong to a single tribe, were it not for the marked physical differences that even Islam cannot modify.

This article attempts to deal only with the large and important group of tribes occupying the banks of the White Nile south of Kaka, the lands around the Sobat River to the east, the Bahr el Ghazal and its tributaries to the west, and also the Behr el Gebel as far south as Shembe. This group includes four tribes, Shilluk, Dinka, Nuer, and Jur, differing in language and mutually hostile, but presenting such marked affinities that they can be classed together in any attempt to systematise the Sudanese tribes.

To the east and south-east these tribes have for neighbours people that closely resemble them, but whose manner of life becomes abruptly modified when the mountains of the Abyssinian border are reached, to meet the new conditions imposed by dwelling in the hills. These border tribes, in turn, shade off imperceptibly into the Galla people and the mixed Abyssinian inhabitants of Menelik's western frontier.

Thus the White Nile group has no very definite and sudden margin to the east. To the West, however, and the south-west, the Dinkas and Jurs contrast markedly with their neighbours, the Golo, Bongo, Kraish, Belenda, and, more remotely, the Fertit and A-Zandeh tribes. So great is the difference that it compels one to believe the people essentially distinct.

To make the difference more apparent, I have arranged the following list of points of contrasts between the groups. To avoid the danger of prematurely docketing them under ethnological names, I call these groups "Herdsmen" and "Cultivators" respectively, selecting the chief interest and occupation of each as its heading.

HERDSMEN.

(Dinka, Shilluk, Nuer and Jur.)

Physical.—Head long and narrow. Figure tall and spare; very ill-developed calf muscles. Colour of skin nearly black. Features rather aquiline than Negro; lips prominent, owing to prognathic formation of jaws. Very scanty growth of beard as a rule, and the average man is without beard or moustache.

Personal Decoration. Men.—Naked, or with a piece of leopard or sheep-skin suspended *over the buttocks*. Hair of head is shaved up to about an inch above ears, and remainder worked into a head-dress.

Helmets of a bee-hive shape made of thickly-woven grass, and sometimes ornamented with an interwoven mass of ostrich feathers. Suitable for defence against club-blows. Skin smeared with the ashes of burnt wood and cattle-dung. Ivory bracelets are worn above the biceps; smaller ones also at the wrists.

Women.—Head shaved. A pair of leather aprons from waist to knee; one in front, the other behind.

Both equally devoted to beads and brass wire.

Cattle.—Extensively owned and of the highest importance.

Agriculture.—Just enough grain is grown to feed the people and make "Merissa."

Cannibalism.—Unknown, and the idea of it disgusting.

Teeth.—The lower incisors are removed.

CULTIVATORS.

(Western Bahr el Ghazal Tribes.)

Physical.—Head round and bullet-like. Figure square and sturdy, with great muscular development. Calf muscles very well developed. Skin plum-coloured or chocolate. Features resemble the typical Negro; flat nose with wide alæ; lips tumid, eyes (especially in A-Zandeh) prominent and handsome. Beard, though scanty, is much better grown than among the "Herds-men," and is cultivated as an ornament.

Personal Decoration. Men.—Clothed with a loin-cloth or a bark-cloth garment, almost amounting to trousers in some cases. Hair is plaited in lines down the side of the skull and (often) worked into "pom-poms" at the end of each plait.

Light grass-woven hats, either square-shaped (A-Zandeh) or "Panama"-shaped (Golo and Bongo); sometimes decorated with a bunch of cock's feathers. Quite useless for defence, except against the sun. Skin as a rule not smeared. Possibly, however, coloured when in fighting trim. Ivory bracelets not often seen.

Women.—Head not shaved. A bunch of fresh leaves suspended in front and behind from a waist-cord.

Cattle.—Nil.

Agriculture.—The chief occupation of the people. This pursuit and the cultivation of poultry provides food and interest.

Cannibalism.—The A-Zandeh (Niam-Niam) are frankly cannibals. The Golo, Bongo and Kraish, though not cannibals, are said to have no objection to *dogs* as food—a probable transition stage on the way to better things.

Teeth.—Among the frankly cannibal peoples the upper incisors are *filed to a point*. Among the "transition" tribes the upper incisors are filed on the inner side only, leaving a V-shaped notch between the central incisors (perhaps a

HERDSMEN.

(Dinka, Shilluk, Nuer and Jur.)

General.—Very conservative, and with great pride of race. Evince but little desire to copy their civilised visitor. In a sense, much more *backward* than the "Cultivators," being naked, thriftless in agriculture, too proud to furnish porters, and constantly at war among themselves.

CULTIVATORS.

(Western Bahr el Ghazal Tribes).

decorative persistence of a once *practical* pointing).

General.—In spite of cannibalistic tendencies are very progressive. Wear bark-cloth or locally woven cotton-cloth. Attempt to copy Europeans, and delight in Western clothes if obtainable. Having many wants, they are glad to earn money as porters, and will generally furnish carriers when these are well treated and well paid.

The White Nile group of Sudanese (the Herdsmen), consisting of the Shilluk, Dinka, Nuer, and (ethnologically) Jur tribes, is of great importance and interest. Its importance depends upon its situation along the great waterway between Khartoum and the southern province of the Sudan, and on the fact that the tribes comprised in it are strong, brave, rich in cattle, and, in the case of the Shilluks, united under a single ruler, sanctified by his descent from a race of kings. The interest of the group is very great, since their remote position has preserved the tribes from the moulding and altering influences of foreign conquerors or traders; so that the observer has presented to him the picture of men living the same life, thinking the same thoughts, driven by the same wants to the same devices as, perhaps, our ancestors in times of remote antiquity.

Baker speaks of these tribes as being, in all probability, the direct representatives of primitive man in these regions. This is a bold statement; but there are grounds for the belief that they have occupied their present position from very early times. The physical type is so constant, the customs and habits of the several tribes so closely allied, and so very different from those of their western neighbours, that a common origin can fairly be attributed to the communities constituting the group. Since, however, they have been long enough separated to have evolved separate languages, different traditions of origin, different deities, and a sense of "race," and since these traditions refer almost exclusively to the country they now occupy, it may be inferred that they have been in their present position since remote antiquity. Their traditions, indeed, must have taken very long to become differentiated, since they appear to tend very little to change. The story of the miraculous origin of their kings, for instance, with a genealogy of these monarchs, was almost exactly the same as told by the Shilluks to

Father Banholzer at or near Fashoda, and as related to Mr. Giffen on the Sobat. Some idea of the time required for a complete branching off of one language from another among such people may be obtained from a short paper, "The Stability of Unwritten Languages," by the Rev. H. Codrington, which recently appeared in a periodical called *Man* (No. 11 in the issue for 1903). Yet this group of tribes has had time to develop within itself four languages, closely allied, no doubt, but sufficiently distinct to be characteristic.

I have hitherto emphasised the points in which the tribes in this group resemble each other, and the qualities they have in common. I must now attempt to indicate the differences between the tribes.

The Jurs claim a common origin with the Shilluks, and seem to resemble them in the closest manner, so they may be put aside as a section (long separated) of the Shilluk tribe. The Nuers, again, would seem to have many affinities with the Dinkas, but nobody has yet had an opportunity of closely studying them, so that they had better be left alone. The contrast, then, is between the great tribes of the Dinkas and Shilluks.

Language.—The most important and suggestive difference is, of course, in language. The extent of this is not accurately known, as no official has yet had time to go deeply into the question, and Mr. Giffen and his colleagues of the American Mission on the Sobat, although they are already able to converse with the Shilluks in their own language, have hitherto been unable to make far-reaching comparisons with others. A Dinka cannot talk to a Shilluk, but apparently each can pick up rapidly the other's language, when opportunity arises. The Jurs, who live in close proximity to the Dinkas, talk Dinka or their own language with equal facility.

Father Banholzer says: "The natives (Shilluks) have perhaps a greater aptitude for languages than the average European. Nearly all the Shilluks can speak Dinka, and a great number understand Nuer." This is probably best explained, not by assuming a great aptitude for languages, but by the close resemblances between the tongues of these peoples. That the languages are or have been closely related is proved by the large number of names of men and places common to the tribes. I expect that a better knowledge of their languages will tend to connect, rather than to separate, these communities.

The Shilluks display one quality rare among the Sudanese peoples. They are, and for ages have been, united under a single monarch. This probably originated in the necessity for unity while

the tribe was spreading north along the White Nile, opposed in its advance by powerful enemies. The proximity of the Beggara Arabs, has no doubt, tended to make it permanent.

The Dinkas offer a strong contrast in this respect. They are divided into sub-tribes, all bitterly hostile to each other. The sub-tribe itself has no continuous administration, but would seem often to be ruled by the family possessing the greatest number of cattle. This, however, is a more permanent arrangement than it sounds, as the principle, "Unto him that hath shall be given," obtains, making it easy for a ruling house to continue ruling.

The Jurs appear to have neither marked adhesions nor divisions, but to be a weak tribe living on the borders of a strong one, and desiring peace and quietness before every thing. The little I know of the Nuers leads me to believe that they resemble the Dinkas rather than the Shilluks, and have adopted "decentralisation" as their guiding principle.

Traditions.—The Shilluk traditions as to their own origin are closely bound up in the story of their royal house, and so differ, as one would naturally expect, from those of the Dinkas. The nature of the difference might also be foreseen. The Bahr el Ghazal Dinkas, so far as we can learn, have been stationary in one place, and have not, except in the case of their *recent* White Nile offshoot, overlapped into fresh territory. Consequently their stories are not concerned with locality, which is taken for granted, but rather with the problem of how they were first created. The Shilluks, on the other hand, migrated, and occupied new lands. Their stories, then, have for their object primarily to explain how they came to be *where* they are, and accordingly deal with their Hegra, and the prowess of their kings.

Villages.—The Shilluk villages differ markedly from those of the Eastern Bahr el Ghazal Dinkas. Among the Shilluks, the houses stand on the ground-level and are grouped close together, forming a compact community. The Dinkas, on the other hand, build their houses on piles to raise them off the ground-level, and a village straggles for miles, each house being as remote from its neighbours as possible, and surrounded by its own patch of cultivation. This difference is not, however, an essential one, but probably depends on the fact that the Shilluks, united under a ruler, have less to fear; whereas the Dinka, trusting nobody, is impelled to isolate himself as far as he possibly can. I have been told that the Western Bahr el Ghazal Dinkas (in the angle between the Jur and Arab Rivers) build in true villages and on the ground like the Shilluks.

It is thus apparent that there are wide differences between the tribes, but none of a kind inconsistent with a common origin. The only reservation is that, if from a common stock, the tribes must have separated in remote times.

On the other hand, there are so many similarities, that in describing the group many points may be spoken of as common to all the tribes. To begin with physical characters, the type is so constant that, from the appearance alone, it is practically impossible to say that this man is a Shilluk and that a Dinka or Nuer. All alike are spare, hard, angular fellows, with elongated heads, prominent jaws and teeth, thin but serviceable legs, and a marked development of heel. The head-dress might give one an idea of the wearer's tribe, as the Shilluks are the most elaborate in this respect, often with great diligence working their hair into a "Sainty Nimbus," as Father Banholzer has aptly called it, or perhaps into a fashion that resembles nothing so much as a Grecian helmet deprived of its plumes. These head-dresses are made permanent by treatment with grease and clay. The Dinka is less remarkable in this respect, often confining himself to a circle of matted pendants, decorative with red clay; and, in fact, when in full fighting trim, concealing his hair by a beautifully made grass-matted helmet, decorated either with a fine clump of ostrich feathers worked into its texture, or a single long feather from the very top of the helmet. The Nuers apparently resemble the Dinkas in this, as do also the Jurs.

In personal decoration, too, and what may be called, out of politeness, clothing, the tribes exactly resemble each other. The women wear leather aprons from waist to knee, one hanging down in front and the other behind. The men are naked, or sometimes clad to the extent of a sheep's tail or a piece of leopard-skin suspended from a waist-string behind. Ivory armlets, made with great skill from a section of elephant tusk, and worn above the biceps, are the favourite decoration of the men, though brass or copper wristlets, a necklace of beads, or a grass-plaited anklet, often serve to make the costume more complete. A few throwing spears, a club-shield, and an ebony club are carried; and a bunch of charms, the most important part of the *defensive* preparations, is worn round the neck.

The women are magnificent with beads and brass rings, whenever they can obtain them, but leave the elaborate head-dress to the men—in fact, usually shave the head. This latter is worthy of note, as it marks them out from the Arabs on the one hand and the

Western Negroes on the other. A border of coloured beads round the edge of the leather apron is greatly admired, and a series of little brass rings (the little rings used for fixing the buttons to the coats of a brutal and licentious soldiery are priceless) are usually worn in the ears by really smart women. In appearance the women, while young, are rather handsome; but the hard life (their destiny is to constantly crush and shift grain to make food for the warriors, their lords) soon deprives them of their beauty, and they rapidly wither to the half-clad, half-fed, and entirely repulsive hags that horrify the traveller. The quality most characteristic of the whole group is the interest which the tribes devote to breeding, tending and understanding cattle. As is also the case among the Galla tribes, traditions give all honour to the possessor of large herds; and indicate even the tending of cattle as a more suitable occupation for a man and a warrior than the plebeian cultivation of the soil. Since, too, cattle are the only currency in large transactions (iron hoes, beads, brass rings, &c., being reserved for smaller bargainings, and being to cattle much as our pennies are to golden sovereigns), the element of avarice joins with the worthier motives of hardihood and self-respect to raise the cult of fat cattle above all others. The Shilluk tradition of the origin of the royal house claims a God-sent cow as the first begetter of the race. National or popular songs celebrate favourite bulls, and the most complimentary nickname for a fine young spearman is "Majoke," which means the leading bull of the herd. The children amuse themselves with making clay models of cattle, the women sing of them, the men devote all their time to them, and are ready to fight to a finish in defence of their own or in the lifting of their neighbours' herds. All drink the milk and regard it as the best of foods, only excelled by the rarely tasted beef to be had when, on some unique occasion of rejoicing, an incredibly extravagant owner kills a bullock.

In Europe some of us pursue wealth, some honour, some merely amusement or food. To the White Nile tribesmen all these motives—wealth, honour, amusement, and food itself—are alike included in the pursuit of cattle. The mention of cattle naturally calls up the idea of wives, since these latter are purchased and the price paid in cattle. The customs relating to marriage and sexual morality are practically identical throughout the whole group, and depend almost entirely on the high intrinsic value of a woman as a marketable asset. The cynic might well claim to have here traced purity to its origin in an almost sordid materialism when he finds among primitive tribes that lust is restricted by customs as

binding as laws, not because immoral, but simply as inexpedient. A man pays from five to ten cows for a wife, and hopes to receive as good a price for his daughters; and as for his sons, they can help him with his herds; so it is well worth while to be clear as to his actual ownership. One suggestive comparison will make the position of the women clearer. Among the primitive Dinkas adultery is usually punished by the killing of the man, but the woman, too valuable to be destroyed, is spared. But with the Arabs, who have arrived at an idea of honour, the woman is killed, as her crime has brought disgrace upon her house, and the enormity of her offence outweighs her monetary value. Some of the Dinka sub-tribes and many sections of the group itself permit adultery to be compounded for by payment of a fine, in cattle, of course. In fact, the whole arrangement is business-like and material to a rather revolting extent. I have before me as I write a tabulated list of marriage laws, discovered to be in use among the White Nile section of the Dinkas (Captain Wilson's report). They relate to nothing except the decisions as to the payments of cattle for wives, the return of the cattle if the wife prove unsatisfactory, the safeguarding of the owner of the woman (be he the father or husband) from loss through fraud, and the disposal of this valuable female property on the death of the proprietor. For instance, here, adultery may be compounded by a fine. The husband can put aside (if he like) the wife, demanding back the purchase-money from her father. The father, in turn, is entitled to recover this amount from the man who has been guilty. Again, if a wife dies before she has been received into her husband's house, he receives back the entire price he paid for her; and so on.

It is obvious that the idea of morality for its own sake does not emerge. The important point is that the owner of a woman shall be at no monetary loss through the unbridled passions of another. One restriction, however, does exist, founded on a sanction other than mere property. Marriage with blood-relations is strictly forbidden. A cattle-raising people would probably have early discovered, by analogy, that such unions are unwise.

In spite of this absence of ideals, the position of the woman is not entirely bad, but in many ways compares favourably with that of her sister in Mohammedan communities. Safeguarded by these legal restrictions and customs, she is free to mingle with her fellow-creatures, unhampered by the severe barriers imposed by Islam. Love, as contrasted with passion, may be a highly complex growth denied to very primitive peoples; but maternal love is the most

essential of instincts, and is as strong on the White Nile as on the Thames. So the women are good mothers, and, incidentally, good wives.

The daily life of the tribesmen must, on the whole, be a pleasant one. In the wet season there is considerable work to be done in sowing and weeding the durrha fields, and, later, gathering and storing the harvest. The process of weeding is of the greatest importance, as the grain is planted at the time of the early rains, the ground having been cleared by fire; and the young durrha would have but a poor chance in competition with the rank and luxurious grass that grows with a rapidity almost visible from day to day at this season of the year. Parties work steadily over the fields every few days with their iron hoes. After about two or three months the durrha has so far asserted itself as to demand all the available moisture and nourishment from the soil, and weeding can then be discontinued. A great deal of this work seems to devolve upon the women, as the men prefer to look after the cattle. In the dry season, when there is little to be done and grain is still plentiful from the last crop, people begin to move about in a sociable manner, relations visiting each other, fishing parties starting for the now shallow rivers, young men making expeditions to trade their beads, iron hoes, ivory, &c., with their neighbours, or, if already wealthy enough, starting in search of a wife. The older men do not work at all, but at this time of year the juniors must exert themselves to patch up the houses and make them safe against the coming rains.

Among Europeans the struggle for existence has become so artificial, so complex and so engrossing, that we tend to be interested only in the struggle itself. We are apt to lose sight of the end in devoting ourselves to the means, and we sometimes forget that our "output," be it literary or scientific, might be justly expressed in terms of the food that it brings us.

The Shilluk is so much more direct in his methods, that when we see him devoting his whole life to his cattle, his crops, and his women, it is difficult to regard him as more than a mere feeding and breeding machine. To do so is to make a grave error. Reticent as he is, and jealous of his thoughts and beliefs, the White Nile tribesman has his store of traditions and ideas, his songs, and the transmitted recollections of old victories and prowess to interest him and to evoke the pride of race that is so strong in him.

The following is the Shilluk story of the origin of the race. It is taken from a most interesting paper by the Rev. J. K. Giffen, of the American Mission on the Sobat.

"Jo-uk," the god whom the people worship, or rather whom they fear, sent to earth a white cow called De-ung-Ad-duk. She came up out of the Nile, and gave birth to a man-child, Ko-la. The third in direct line from Ko-la was named Oo-qua. No mention is made of the *mothers*, or where they came from.

Oo-qua, in his wanderings by the river, often saw two maidens come from the water to play in the shallows near the bank. They were very beautiful, with flowing hair; but Oo-qua was not so blinded as to fail to notice that their lower extremities were uncommonly like the tail-end of a crocodile. In spite of this, the young man found them sufficiently attractive, and often asked them for a drink of water (not quite ingenuous, I fear, as the river was there for his drinking if he really required it), but was always refused.

One day he saw them seated together on this bank. The opportunity was more than he could resist. Stealthily approaching, he seized them and, heedless of their clamour, carried them off to his house.

Responsive to their cries appeared their father, hitherto unseen by Oo-qua, and whose very existence had not even been suspected. He must have been in painful contrast to his pretty daughters, for while the left side of his body was human, the right was green, and frankly saurian; an arrangement with fewer æsthetic possibilities than the bilateral symmetry of his children.

"Who are you?" asked Oo-qua. "I am called," replied the parent, "Ood-dil-jil, and you have stolen my daughters Nik-kai-ya and Oong-wadh. Why do you want them?" "They shall be my wives," said Oo-qua. "You are mistaken," answered Ood-dil-jil, "they can never marry; moreover, they can give birth but once!"

Oo-qua, however, in spite of these hard sayings, made a feast and married the ladies. Nik-kai-ya belied her foretold character by giving birth to five children in all, two sons and three daughters. Her sister, however, had one son only.

The eldest son of Oo-qua, by Nik-kia-ya, was Nya-Kang, a person of unequalled importance in Shilluk tradition. He favoured his grandfather and his mother by being partly crocodile in appearance. He was the first of the Shilluk kings, and is deified in their religion, being in the position, perhaps, of an intermediary between god and man, as to him, and not direct to Jo-uk, sacrifices are made.

Oo-qua had three other sons by a third wife (as to where *she* came from, nothing is said). On the death of Oo-qua, a quarrel arose as to whether Doo-wad (the eldest of these three) or Nya-Kang should succeed him.

The quarrel waxed so fierce that Nya-Kang, with his brothers and sisters, and also his half-brother, Jew, the only son of the crocodile lady Oong-wadh (*i.e.*, all the "Crocodile" stock), fled, and after a long journey settled at Fashoda (as the Shilluks on the left bank think, or at Sobat, as those on the right bank assert), there to found the great kingdom of the Shilluks that still exists.

To more rapidly people his kingdom, Nya-Kang, who seems to have possessed magic or divine powers, changed hippopotami, crocodiles, antelopes and other wild creatures into men and women. When these had sufficiently increased and multiplied to ensure the future of the race, all the directly animal-created men and women were destroyed, in order that this origin might not be remembered.

Their descendants form the common people, as opposed to the royal house of the blood of Oo-qua. These latter still exercise authority, and are said to preside over all religious ceremonies. Father Banholzer also mentions that the descendants of the kings are called "Gwared," while the common people are called "Ororo," and are entirely subject to their aristocracy. It would be interesting to carefully compare the physical characters of the Gwared with those of the Ororo, as among primitive people the aristocracy is so often a conquering tribe, with its despised and vanquished enemies for its slaves. The contemptuous story of the origin from wild beasts also may point to hostility between the classes, unless, indeed, it be connected in some way with Totemism, which may well be the case.

To return to our legend. The mother, Nik-kai-ya, seems to have accompanied the flight of her sons, and to have reached their new country. It is said that she still exists, and will never die. She is able to assume different forms, but her favourite one is that of the crocodile, and she is always near the river. In her *rôle* of crocodile she takes people from time to time. This is looked upon as an honour to the family of the victim. The latter, indeed, sometimes returns, and a case of this resurrection from the Nile was recorded by Mr. Giffen as having very recently happened on the Sobat.

Nik-kai-ya is even invoked as a judge in complicated cases, her decisions being particularly unerring as to the parentage of illegitimate children. The suspected men are taken to the river bank. A goat is also tied up close to them, either as a sacrifice or to attract a crocodile. The guilty man is recognised and carried off by Nik-kai-ya. One imagines that, with this ordeal in view, many men prefer to "own up" and pay the fine.

The Kings.—The list of twenty-six kings from Nya-Kang to the

present "Melik," was obtained by the Rev. J. K. Giffen at Sobat; and Father Banholzer, on the left bank, independently drew up a list of the same number, with a very close correspondence between the names; showing that, though with no means of record beyond oral traditions, history is not forgotten among the Shilluks.

Father Banholzer talks of the appointment of kings by combined inheritance and selection; in other words, the kings are selected from within a certain group of claimants, all of the royal stock.

Banholzer's report mentions selections from among the "Sons of the Kings," an elastic term which may include near relations perhaps. The right is, however, acknowledged to belong *primarily* to the sons of the late king, and even then usually covers a wide field, in a nation whose kings vie with Solomon in the number of their wives. The descendants of the kings constitute a nobility, the "Gwared," and, as has been mentioned, exact respect and service from the "Ororo," or common people.

Mr. Giffen has ascertained that there is also a hereditary priesthood from the family of Jew, son of Oo-qua and Oong-wadh. The selection of the king takes place at Debalo in the Kwom district, and is carried out by the leading men of the country from among the royal claimants. On being selected, the new king proceeds at once to Fashoda, the royal headquarters, and the defeated rivals find it convenient to leave Debalo as quickly as possible also. The life of a king would appear to be precarious, as there are many malcontents among the disappointed candidates for the throne, and many enemies as a result of the royal exactions of cattle. The late king had his food prepared in his presence or "tasted" for him. He is said to have slept in the day and remained all night awake and armed. It was his custom, when hearing complaints, to place the complainant outside his courtyard, whence the latter shouted the story of his wrongs. A picture of the home-life of this monarch is recorded by Banholzer: "10 a.m. to 3 p.m. was the usual time for the king to sleep; it was the duty of nine girls to be at his side, fanning him, during his sleep; he meanwhile lying quite naked on his sheep-skin, like a black snake."

To constitute his penal code, the king has the unwritten but very binding laws and customs of the tribes. Disobedience of these laws is punished by a royal raid on the village of the delinquents; and the cattle and women that accrue to the king through the misdemeanours of his subjects make the administration of justice a most profitable source of revenue. This is, no doubt, open to all sorts of abuses; but on the whole the system appears to suit the

people and the country. To quote again from Father Banholzer's description of the last monarch: "He was a strong king. People from Kaka, as far as Junago, feared him. Very few thefts were committed during his time. Unmarried girls could go any distance without the company of men; whilst disputes, rows, &c., were comparatively rare. Witchcraft and other secret arts, which lead to much trouble, were prohibited. Dances were regulated." The efficiency of the whole system depends on "a strong king."

Religion.—The religion of the Shilluks appears to be primitive in the extreme, but by no means non-existent, as Baker would let us believe. Probably fear, rather than love, is the active principle of their attitude to their God; but such expressions as "God has carried you," "God keep you," as greetings between friends, imply some genial attributes at least to their deity. When ill, a common lamentation is "Er ra, Jo-uk? (or why, Creator?)"—a touching repetition of the cry of puzzled and suffering humanity in all ages and all creeds. Jo-uk, the creator, is conceived to be a vague being who permeates and influences the fortunes of men, and who must be appeased by offerings. These offerings, however, are made to the deified Nya-Kang, and not direct to Jo-uk. Dances seem closely bound up with religion.

I have mentioned the hereditary priesthood, and quote the following statement on the subject from a letter of Mr. Giffen's: "As to priests, I understand that they hold their office as hereditary. Jew, who was the brother of the Nya-Kang, was made his priest and prime minister; and from the line of Jew are the priests to-day. These priests, and there is one in every village or group of villages, with a sacred spear strike the first blow at every sacrifice. This seems to be their chief official function, although they are held in esteem above others." Doubtless there is much to be learnt about the Shilluks beliefs, and many interesting points to be settled, as, for instance, the relations of priests to magicians, doctors, and rain-producers on the one hand, and to the tribal morality and law on the other.

As to the religion of the Dinkas, they too believe in a god and creator, known as Deng-Deet. Their information about him is of a more familiar nature than that of the Shilluks about Jo-uk. They attribute to him a wife and family, and a malignant relative, expelled from heaven, who corresponds to a devil. Their traditions record that men were formed from boiling fat by the wife of Deng-Deet, at his request.

There are various points about both the Shilluk and Dinka

traditions that call up a suspicion of ancestor-worship. For instance, the deification of Nya-Kang and his mother Nik-kai-ya is a case in point; and these ancestor-gods, again, were the descendants of a white cow, sent from Jo-uk, and, no doubt, divine. The family party worshipped by the Dinkas, and credited with the creation or fabrication of the human race, suggests a group of ancestors elevated by accumulating traditions from earth to heaven.

As to the beliefs of the Nuers and Jurs nothing has yet been described.

Description of the White Nile Tribes.—The question of the origin of these White Nile tribes is very obscure. Baker inclined to think them the aboriginal people of the land, but founded his opinion on slender evidence. In fact, he was not always consistent in that opinion.

Glancing at the group and its environment, *a sharp line of demarcation*—founded on such solid distinctions as the average shape of the skull, the general physical type, and the possession of a devotion to cattle—is apparent between the Dinkas and their western neighbours, the Golo, Bogo, and ultimately the Niam-Niam tribes. To the east and south-east no such line can be drawn, but tribes shades off into tribe gradually and imperceptibly, until Hamitic or mixed Hamitic and Semitic (Abyssinian) peoples are met with.

Speaking of the Gallas (a Hamitic tribe), Keane lays stress on the following points: "All still retain their tribal organisation, each tribe comprising two social divisions—the aristocratic "Protuma" (herdsmen) and the plebeian "Argatha" or "Kutto" (tillers of the soil). These probably represent the agricultural aborigines subdued by the pastoral Gallas, who at some remote period penetrated from the north into their present domains, where they still regard them as invaders." . . . "Some are still Pagans." . . . "The men wear a cotton loin-cloth saturated with butter . . . and ivory armlets, one for every enemy killed in battle." "The dressed-skin smock and short tunic of the women are supplemented by copper or tin bracelets and a profusion of glass beads worn round the neck. Polygamy is prevalent." . . . "All authority is centred in the Protuma class." These points remind one of the Shilluks. The two classes, one aristocratic and concerning itself entirely with cattle, the other subordinate and plebeian, and compelled to carry out the less distinguished work of agriculture, are very like the Gwared and the Ororo.

One thing at least is certain, that the White Nile tribes have been settled in their present lands from remote antiquity; and if

related to the Gallas, probably preceded them—an earlier wave of invasion from the east or north. Of course, to mention such an origin as possible is the merest speculation. Before offering it as an opinion it would require confirmation by the results of closer study of the language, beliefs and physical characters of both tribes than has yet been made. They are, as I have said, clearly marked off from the tribes to their west, and very hostile to them, and full of unspeakable contempt for cannibalism. They, with their lower incisors removed, and their contempt for cannibalism, contrast with their neighbours of the filed teeth, sharp and horribly suggestive, and with avowed or tolerated man-eating propensities. One is almost tempted to find here an explanation of the removal of the incisors among the White Nile peoples that puzzled Baker so much. May it not have arisen as a symbolical distinction between them and their hated enemies? However, one should fight against the temptation to *speculate* as to the origin of savage customs, although it is so much less troublesome than to investigate. With this sentiment as a corrective to the perhaps rash suggestions of a Hamitic origin for the White Nile group my article must close.

ON THE WORKING OF AN OUT-PATIENT DEPARTMENT IN MILITARY HOSPITALS.

BY CAPTAIN F. E. GUNTER.

Royal Army Medical Corps.

WHEN I first joined the Service I was struck with the number of cases of a trivial nature treated in military hospitals. These in a civil hospital would be treated in the out-patient department, and I was determined that, when I had the opportunity, I would see if it could not be as efficiently worked in the Army as in civil life. It is evident that if it can be carried out the plan has many advantages. Much labour is saved, the staff of the hospital has more time to attend to the really sick, medical officers are saved the weariness of "signing up" diets for comparatively healthy men, and the men themselves prefer it. The following is the routine as carried out here. The medical history sheets of all men reporting sick are placed on my table, and to each of these a half-sheet of foolscap is attached. On this I write any notes that may seem necessary regarding the man, *e.g.*, his disease, treatment, whether a defaulter, and so on. The man then goes into the surgery, where he receives medicines and any surgical treatment that he may require. A special orderly is detailed for the work in the surgery, who performs much the same duties as a dresser in the out-patient department of a civil hospital. The advantages of the "daily note system" are obvious. It is impossible to keep details in one's head of every man. Moreover, should any one be acting for one, he at once picks up the thread of the man's medical history, and again, one soon finds out what men go sick when they are anxious to escape a duty.

I find that in practice many cases of primary syphilis do not require to be admitted into hospital at all. I make a note on the sick report that the man should not be permitted to leave barracks while under treatment. The object of this is, of course, to prevent his conveying the infection to others. This is done in several of the other Legation Guards in Pekin. The great majority of cases of secondary syphilis do not require admission at all. A list of all cases of syphilis is kept in the hospital, and they are ordered to attend once or twice a week. They are given enough mercury (usually in the form of Hutchinson's pill) to last them for this period. There is no compulsion as to whether they take these or not, but

from the satisfactory progress that they make I am convinced that they do. I tried intramuscular injections for over a year, but have long since discontinued them, as I think they have no advantage in most cases over the oral method. Whitlows, slight sprains, and other slight surgical ailments can be treated quite efficiently in the out-patient department.

Of course, this system requires the support of officers commanding units, but I think it would be invariably as readily given as I have found it has been here. It may be said that in a small station where the sick are seen at the hospital and there is no inspection room in barracks the system is easy, but that with an inspection room it would be more difficult. Undoubtedly it would, if the system of inspection rooms with a regimental N.C.O. and no dressings, and hardly any medicines to speak of, is still in vogue, as it was when I was at the Cavalry Depot at Canterbury. The inspection rooms should be more comfortably fitted up, with some privacy about them, suitable dressings, washing arrangements and instruments should be supplied, and a fair number of the most useful drugs should be on hand. A reliable man of the R.A.M.C. should be in charge. All the medical history sheets of the men in the station should be kept in the inspection room, and those men who come sick should have their sheets on the table for the information of the medical officer. The medical history sheets of the men who are marked hospital, together with the "daily notes" on the half-sheet of paper, should be sent to the hospital for the information of the officer in charge. With him, of course, would rest the option of taking him in or not, but in the majority of cases he would presumably admit him. On discharge from hospital the medical history and daily note sheets should be sent back to the medical inspection room.

It may be thought that by this out-patient system men do not recover so quickly. This, from a six months' trial, I have found not to be the case. The officer in charge should undoubtedly be one of some little experience of the duties of a soldier, otherwise he will make mistakes, however good a "doctor" he may be. He might combine with his duties in the inspection room the duties of sanitary officer to the barracks. By this he would gain an insight into the prevailing diseases of the station: but this is by the way. Attached is a specimen of the "daily note sheet."

DAILY NOTE SHEET.

Private Jones, 1st S. F. March 13th, 1904—Bronch. catarrh, temperature 99°, excused duty, moist expectoration. March 14th,

1904—Improved, temperature normal. Medicine and duty. March 24th, 1904—Soft chancre, slight, iodoform, not to leave barracks while attending. March 29th, 1904—Medicine and duty. April 5th, 1904—Pain in head, temperature normal; defaulter, cautioned. April 7th, 1904—Headache, slight cough, temperature 100°. Hospital. F. E. G. (initials).

Remarks by Officer in Charge of Hospital on Discharge. Seven days' light duty. F. H. (initials).

N.B.—This should not be in any way a stereotyped form, like the medical history sheet. If it is so it narrows the scope of the remarks very much.

HINTS ON SERVICE IN CEYLON.

By MAJOR F. W. BEGBIE.

Royal Army Medical Corps.

COLOMBO, the capital of Ceylon, and the headquarters of the garrison, is situated on the western coast of the island, in latitude 6° 56' N., and longitude 79° 51' E. The approach to the harbour from the sea is very fine, showing the island to be covered with trees and tropical verdure, being a welcome relief to the eyes of the traveller, dazzled by the glare of the sun on the Indian Ocean. It would be well for officers coming to the island to write, before arrival, to a friend who knows the country, asking him to engage a trustworthy head servant, or *Appu*, as they are called locally, to meet them on arrival. It is absolutely necessary for future comfort that the head servant should be a thoroughly trustworthy man, as robberies are a matter of almost daily occurrence, and the house-servants are always in league with the thieves (and the police); but so cleverly are these robberies effected, that it is seldom or never that one hears of the perpetrators being brought to book. The new arrival having arrived inside the breakwater—a magnificent structure, holding a water area of 500 acres—and being met by the previously engaged *Appu*, now selects his hotel. Of these there are several, but only three are patronised by Europeans. The Grand Oriental Hotel is close to the landing stage. It is a modern, up-to-date, and very comfortable hotel. Facing the Grand Oriental Hotel, on the opposite side of the road, is the Bristol Hotel, a smaller, less expensive, but equally well-managed institution; and finally there is the largest of the three, arrived at after a drive of a mile and a quarter along the sea-front, the Galle Face Hotel, a cool and very comfortable hostelry. It would be well on arrival at any of these to inform the manager that it is to join the garrison that the applicant has arrived, as then the charge is Rs. 7 per diem, as against a very much larger figure for the casual passenger. Only light baggage is allowed to be landed with the passenger, the remainder being taken to the Custom House yard. A duty on nearly every article that can be named is levied on first entering the island.

In Colombo the climate is of the “sponge” variety, and residents hardly ever know what it is to feel dry. In a climate of this nature all European clothing, silver, bicycles, iron-work, &c.

and ladies' dresses, soon become hopelessly ruined. It would be well for the newly arriving officer to bring as few European clothes as possible with him, for the reason first stated. Dress suits and summer clothing, both of the thinnest variety, are necessary for all stations in the island, with the exception of Newera Eliya, where the weather can be very cold. In uniform, white drill and khaki are worn; both can be obtained and well made by the master tailor in Colombo at less than a quarter the price paid for the same at home. When in mufti, flannels and Cannanore cloth are almost universally worn, and can be obtained and well made locally. The most necessary articles to bring to Ceylon for service in any station in the island are English boots and a light mackintosh, as the rainfall in the island is very heavy. The best time to arrive in Ceylon is November to February, especially if the officer be accompanied by wife and children; and ladies would do well to bring out very thin English summer clothing, with a warmer dress or two for wear in the hills. Ball dresses are required, and dinner dresses of a more or less elaborate nature, as during the race week in August in Colombo, and again during February in Newera Eliya, the ladies vie with each other to out-do Ascot. Cloth uniform for officers is not required. The stations open to Officers, Royal Army Medical Corps, in the island are Colombo (3), Trincomalee (2), Kandy (1), Diyalawala (1), and the Senior Medical Officer at Newera Eliya. The allowances in the island are good; ration, forage (at Kandy and Trincomalee), rickshaw, colonial, fuel and light, and table money are allowed, amounting for a Captain to about Rs. 270 per month. It must, however, be remembered that everything is much more expensive than in India, and the further up country the more expensive do things become.

Quarters are provided in all the stations in the island, and are good and comfortable, albeit rather small for married officers in some instances. Furniture can all be bought or hired from the Anglo-Oriental Furnishing Company, or Don Carolus, in Colombo. If about to be stationed up country it is necessary to obtain the furniture in Colombo, as it cannot be got in up-country stations (except at auctions). Plate, linen, dinner, breakfast and dessert service, as well as glass, must be brought from home, as these articles are all very expensive in Colombo. As regards servants, a bachelor requires only an *Appu* and a *Podiou*, or small boy; but a married officer will require an *Appu*, Rs. 20; second boy, Rs. 12; house coolie, Rs. 15; cook, Rs. 18; kitchen coolie, Rs. 12; house-keeper, Rs. 15. Of course, the wages will differ in different house-

holds, but the figures named are about the average. A horse and cart will be found very useful at all the stations in the island, except Diyatalawa, where only riding can be done. Horses can be obtained in Colombo from the dealers, or, better still, from friends going home. Both Australian and Indian horses are imported, and a very fair 14·3 Australian cob can be bought for Rs. 700, and Arabs at a smaller cost. Polo ponies will have to be brought from Bombay or Calcutta. Very good dog-carts and victorias can be obtained locally. English saddlery and harness should be brought from home, as they always fetch a good price on leaving the island.

There is an excellent civil hospital in Colombo, where the staff are always pleased to welcome R.A.M.C. officers, to see curious Eastern cases, or assist at operations. As regards amusements, polo, golf, tennis, cricket, hockey and football can all be played, not to mention croquet. There are two swimming baths, and people are extremely hospitable. It is, however, an expensive station. Officers arriving should, after reporting their arrival, call at Queen's House on the Governor, and at Braybrooke Hall on the General Officer Commanding.

Kandy.—The mountain capital of Ceylon, the sanatorium for the women and children of the garrison, some four hours' run by train from Colombo, provides a billet for a Captain or Lieutenant, there being only one company of the regiment doing duty there. The place has been named the Garden of Eden, and is equally famed for being the headquarters of the Buddhist religion, and the prettiest spot in the world. An extensive private practice can still be done there, it being the only place in the island where this chance can be obtained. The climate is genial, but hot from March to June, with, however, cool nights. The planters in the neighbourhood go out of their way to be kind and hospitable to officers, and cricket, hockey and tennis, the last of a high order, can all be played. A gymkhana and a race meeting take place once or twice yearly.

Trincomalee, the second largest military station in the island, is situated on the eastern coast, and is 117 miles by road from Kandy, and 97 from the nearest railway station. The journey can also be accomplished by sea, but the boats are small and the passage generally a very rough one. Two R.A.M.C. officers are on duty here. The place is the most Indian of all the stations in Ceylon, and from March to June very hot. The climate is, however, dry, and not at all like that of Colombo. Good fishing and snipe shooting can be had. Golf, tennis, cricket and hockey can be played. If

the new arrival is likely to be stationed at Trincomalee, a 12-bore gun and a good rifle should be brought, as leopard, bear, sambar and deer are to be had about 25 miles away. The jungle is, however, very dense and difficult to get through. Elephant and buffalo shooting can also be obtained, the former on payment of Rs. 100, and the latter on payment of Rs. 20, for a licence.

Ladies and children should not remain in Trincomalee from March to June. Provisions are expensive, as all have to be imported from Colombo by sea. Dress for ladies should be of the thinnest and least expensive kind. A coach runs from Trincomalee to the nearest railway station (97 miles) daily, taking a day and a night over the journey.

Diyatalawa, now famous as the old camp of the Boer prisoners of war, is used by the troops as the camp of exercise, and by the Royal Navy as a sick depôt. One R.A.M.C. officer does duty here and is provided with quarters, as in the other stations. Food and servants are more expensive here than elsewhere and cannot be obtained locally, but are generally brought by rail from Colombo. The climate is very good, warm in the day and cold at nights. Tennis, cricket and elk hunting on foot can be obtained.

Newera Eliya, the residence of the General Officer Commanding and staff from February to June, and also the sanatorium for the troops, possesses a climate like Switzerland, and one of the best golf links in the East. Fly-fishing, tennis, croquet and cricket can all be played. In February a very good race meeting is held and very largely attended. European clothing is worn, as the weather is often very cold. The new arrival will find a bicycle of the greatest use to him in all the stations in the island except *Diyatalawa*. Motor bicycles can be bought in Colombo, and are a great help if stationed in Trincomalee. Dogs of all kinds are found doing fairly well in the island, and there are two or three dog shows annually.

Finally, I should suggest that it were best for ladies to bring clothing of the lightest and simplest description for every-day use, as what between the red dust of Colombo and the Dhubie man, very little is left of good garments. A good supply of ribbons and such-like articles should be brought, and boots, shoes and gloves should be kept in air-tight boxes.

THE WATER SUPPLY AND SANITATION OF CAMPS IN INDIA.

BY LIEUTENANT-COLONEL H. S. MCGILL.

Royal Army Medical Corps.

THE following remarks are the outcome of some experience in the East and refer to certain sanitary measures, the necessity for the observance of which is too often more or less under valued by military officers, both during peace manœuvres and on field service.

WATER SUPPLY.

The first and most important measure to be carried out by the medical officer when troops occupy an encampment is to select the source for the drinking water supply and take steps to have it kept free from any pollution. When a river or stream provides the supply, precautions should be taken to see that the water is procured from a point above the camp, and the places marked out for bathing and for watering animals. In standing camps the approach to the intake from the river or stream should be roughly paved, the surface in its vicinity cleared of rank vegetation, the stream slightly deepened at the intake if necessary, and all vegetable *débris* removed. Washing of clothes and bathing should be strictly forbidden near or above the intake; all animals must be kept away from its vicinity, and if required, a light dam might be thrown across the stream just below the intake. When drinking water has to be procured from a river with high banks, it should preferably be drawn by means of a light pump with a strainer attached to the end of its suction pipe. When it has to be taken from a channel in a broad, dry river-bed, sump wells or small galleries should be dug a few feet from the edge of the stream, out of which, after filtering through the intervening layer of sand and gravel, the water can be taken by a pump or clean zinc bucket. When a spring forms the source of supply it should be cleaned of all leaves and *débris*, its head dug out, and a cask or box sunk in it, to lessen the chance of pollution of the water when it is being drawn. A clear area with a radius of at least twenty yards should be rigidly preserved round the spring, on which no bivouacs, cooking places, or animals must be allowed. No crowding of people should be allowed round about nor should animals be permitted to approach the vicinity of a drinking water spring: the water should be drawn in clean metal vessels. In

standing camps the spring should be surrounded by a clear protecting zone with a radius of 100 yards, which must be kept unoccupied. The surface drainage from the ground above must be prevented from entering the spring by an intercepting drain, cut so as to conduct the surface water to a point below the spring-head. The surface of the ground should be sloped away from the spring and shallow drains dug to carry away all spill-water. When the drinking water has to be procured from wells, preference should be given, the quality of the water being equal, to one which is clean, in a good state of repair, not too close to a village, nor in the centre of recently manured fields. A clear zone with a radius of twenty yards ought to encircle each drinking water well, no crowding should be allowed around the well-mouth, animals must not be taken near it, and the water should be drawn up by a light pump or clean zinc buckets. In standing camps wells should be cleaned out before being taken into use, if it is necessary and practicable, surrounded by a protecting zone with a radius of 100 yards, provided with a low stone coping, and if possible a cover, while spill-water drains should be cut outwards from the vicinity of the mouth. The water should always be drawn by means of a light pump with a strainer attached to its suction pipe. When water has to be procured from a tank or pond, the supply for drinking should be obtained at a site as remote as possible from the places where the animals are watered or washing is done. In standing camps all animals should be watered from troughs placed at a little distance from the tank, in which bathing and washing of clothes should be strictly prohibited. When it is necessary to search for water, the borings should be made at the bottom of a hollow in a plain or where vegetation is luxuriant, at the lowest point near the foot of hills, at the junction of the watercourses from two valleys, or under the highest side of a valley. Water from marshes should not be used if any better is obtainable.

On active service troops often suffer severely from water-borne diseases, and various plans have been suggested by which it was hoped to provide them with a pure drinking water. It is generally necessary to clarify the water before making an attempt to purify it, and this can easily be done by sedimenting with alum or straining it through a cloth or Maignen's filter. In order to render water innocuous it has been proposed to sterilise it by means of chemicals, the principal agents recommended being potassium permanganate, bromine and sodium bisulphate, but the results obtained under the conditions of active service have so far not been satisfactory, and the

methods have been reported as unreliable and cumbrous. Lately, Vaillard has sterilised water in ten minutes by means of tabloids containing (a) potassium iodide and sodium iodate; (b) tartaric acid, and (c) sodium hyposulphite.

The Pasteur-Chamberland, Mallie, and Berkefeld filters can efficiently sterilise water, but they have not proved satisfactory when tried with moving bodies of troops, as portions of them are easily broken, leakage often occurs, allowing the sterile and raw water to become mixed, and the filtering medium requires to be frequently cleaned and sterilised, both of which operations are liable to cause minute lesions of the surface of the bougies, with consequent impairment of the germ-stopping power of the filter. The most suitable filter for use on field service is the Berkefeld, which, though not so efficient and durable as the other two patterns, has the advantage of being more rapid in action. Lengthened trials in India and Netherlands—India, with installations of these filters containing multiple bougies—have shown them to be very unreliable and troublesome when employed on tropical service. Leakage and breakages constantly occur, repairs are frequently required, and no reliance can be placed on the efficiency of their sterilising powers unless frequent bacteriological examinations of the filtrate can be made.

Only by boiling can water be rendered absolutely safe, and unfortunately the process is often difficult to carry out on active service. Two forms of field sterilisers are at present highly recommended. One, the Forbes-Waterhouse water steriliser, is the pattern used by the American Army. This apparatus weighs 90 lbs. when packed, and can deliver hourly 25 gallons of sterile water, having a temperature 15° to 20° F. higher than that of the raw water, with the consumption of only 8 ozs. of kerosine oil. The apparatus should be worked under shelter, as wind easily disturbs and extinguishes the flame of the lamp. The second pattern of steriliser is Dr. Leigh Canney's, which consists of a copper cylinder, the bottom of which is involuted into eighteen pockets, so as to increase the area of its heating surface. The whole apparatus weighs 60 lbs. and can sterilise 6½ gallons of water in from nine to thirteen minutes, according to the temperature of the water, with the consumption of about 8 ozs. of petroleum. Dr. Canney states the water can be cooled in six minutes to a point at which it may be easily drunk by simply covering the mug containing it with a wet cloth. I find in India that by this method the water can only be cooled to 160° F. in six minutes, and twenty-five minutes have

to elapse before it can be swallowed with comfort. The advantages of the Forbes-Waterhouse are: (a) Continuity of action, as the reservoir holds enough oil (5 quarts) to allow of it being worked for twenty-four hours, the raw water can be continuously supplied to the apparatus from a barrel, and the sterile water is delivered unintermittingly; (b) conservation of heat by the heat exchanges, with consequent economy of fuel, only 8 ozs. of oil being required for the sterilisation of 25 gallons of water; (c) comparative coolness of the sterile water, which on delivery is not more than 20° F. above the temperature of the raw water. The disadvantages are: (a) Cost; (b) weight. The advantages of the Leigh Canney steriliser are: (a) Cheapness; (b) lightness; (c) simple to work; (d) easy to repair; (e) can also be used to boil soup or tea. The disadvantages are: (a) The large consumption of fuel, 1½ pints of oil being required to sterilise 25 gallons of water; (b) continuity of action cannot be maintained, as time is lost during the emptying and refilling of the boiler; (c) the sterile water takes twenty-five minutes after delivery to cool down to 130° F. The greater weight of the Forbes-Waterhouse steriliser is not much of a drawback to the apparatus, as it is almost counterbalanced by the extra fuel required to be carried for the Leigh Canney steriliser. Both the sterilisers are strongly constructed and should be able to withstand a fair amount of rough usage when on field service. The output from each apparatus is about 25 gallons per hour, as the Leigh Canney pattern must lose in delivery if worked for an hour or more, owing to its want of continuity of action.

It is necessary (except when the drinking water is procured from a deep well or main spring, every precaution being taken to prevent pollution of the supply during collection, distribution and storage) that all standing camps should be provided with approved water which has been sterilised by means of either of the above apparatus. Troops on manœuvres and on the march should also be supplied with sterile water. As carts can be used on such occasions, the necessary apparatus for a regiment—four sterilisers and two 200-gallon storage tanks—may easily be sent on ahead of the troops, and sufficient water sterilised in four hours to satisfy the wants of the men when they arrive in camp and to replenish the water-bottles and water-carts, or pukhals, for the following day. It is a far more difficult matter to provide moving bodies of troops on active service with sterilised water; for it is not always practicable to carry the water boilers and necessary fuel with a rapidly moving, lightly equipped punitive force, and almost impossible in the case o

mounted troops employed on a reconnaissance lasting several days. A scheme such as Leigh Canney's, if attempted to be carried out with a force of 10,000 men, would require at least 140 mules for the transport of apparatus and the fuel necessary for fourteen days, and the sterilisers would probably not be available at the end of a long day's field operations, when the water-bottles and carts are empty and the men ready to quench their thirst at the first ditch. With the best endeavours, water-carts and pukhal-mules often cannot keep in constant touch with their units, and I do not anticipate that the mules with the sterilisers would do better. There is no doubt that troops should be supplied with some portable and rapid means for sterilising water on the field, and I think the only method will be to provide each man with sterilising tabloids and instruct him to invariably use them with any water of doubtful character. In addition, every 200 men should be provided with one steriliser, in the charge of specially trained men, which could supply them in four hours, while encamped, with sufficient approved water for their water-bottles and carts, or pukhals; though in the case of troops marching all day, camping late, and starting early next morning, the boiling of a sufficient quantity of water to meet requirements will often be found a very difficult matter.

The Forbes-Waterhouse steriliser is, I think, the best pattern for use in the field, as it has several advantages over Leigh Canney's, the lightness of which is nearly counterbalanced by the weight of the fuel required to be carried for its operation. Besides, the only type of steriliser which will be of practical use on the field is one that can supply the thirsty soldier with cool sterile water in the shortest possible time, and the Forbes-Waterhouse apparatus meets this requirement better than any other that I am acquainted with. In the case of mounted brigades on a rapid reconnaissance, companies detached to proceed on picquet almost as soon as the force has encamped, and scouts, the safety of the water supply will have to be assured, after all the approved water they may have taken with them on leaving camp has been expended, by sterilising tabloids and conversion of the water rations into tea. To obviate as much as possible the drinking of unsafe water by the men, the company officers should satisfy themselves that all water-bottles and carts, or pukhals, are filled with boiled water whenever it can be provided before the men leave their bivouac, and at the same time they should impress on them the necessity for, and safety resulting from, moderation in drinking while in the field and on the march, so that they should not be without some good water at the end of the day's operations.

Notwithstanding the very best efforts on the part of officers, it will often be difficult to persuade the men of the advisability of husbanding their good water, and next to impossible to prevent them drinking from the first available source when they are hot, tired and thirsty, and no sterile water is at once procurable. Drinking water should always be carried and stored in camp and in the field in covered metal vessels, which must be provided with taps and frequently cleaned. Leather pukhals and mussacks must never be employed for these purposes, as they are generally dirty and impossible to clean with any degree of certainty.

The minimum amount of water required per head per diem on field service is three gallons in hot weather and two gallons in cold, half being used for drinking and cooking purposes and the rest for the maintenance of cleanliness. This amount may have to be reduced on occasions to one gallon per head, cleanliness being then disregarded. In standing camps the daily allowance of water should be about five gallons per head, and never more than ten gallons; since there is difficulty in disposing of much surplus water when there are no drains. In connection with the incidence of the water-borne diseases—enteric, cholera and dysentery—among troops in camps and on field service, it should always be kept in mind that the men will be less susceptible to them if the camp area is carefully sanitated, all refuse removed and burned, excreta buried deeply and covered several times a day, trenches frequently disinfected, all cases immediately isolated, and their clothing, bedding, feeding utensils and tents disinfected. These sanitary precautions will also assist in preventing the spread of disease.

CAMP SANITATION.

Cooking Places.—These should be placed on the flank of the camp which is opposite to the side nearest the trenches, just inside the perimeter when required for night work, but outside it when intended for use during the day, and at least 100 yards from the nearest latrine or urinal. The surface around kitchens should be cleared for a radius of at least ten yards and kept scrupulously clean. Kitchen refuse must always be kept separate from ordinary dry rubbish, and neither it nor the sullage water should ever be thrown on the ground. In temporary camps occupied for only one or two days, cook-house garbage and slops may be cast into separate small pits about two feet deep, which are to be dug outside the perimeter. The earth at the bottom of the pit for slops should be well loosened for a depth of a couple of inches and a little loose

earth should be thrown over the slops and dry refuse several times a day. All kitchen refuse pits should invariably be completely filled in before the troops march out of camp. In standing camps all cook-house garbage and slops should be deposited in separate covered zinc or tin receptacles, which are to be emptied at least once a day and disinfected by chlorinated lime or by burning some dry litter in them. The ground on which the receptacles are placed should be well beaten down and kept clean, the sites being frequently disinfected and moved from time to time.

Disposal of Refuse.—Refuse in any form should never be permitted to lie about a camp area. In temporary camps all rubbish should be swept into heaps and burned as soon as the camp has been struck. In stationary camps the tent floors, spaces between tents, and the camp streets should be swept daily. All light rubbish, paper, fragments of food, &c., should be collected in gunny bags to prevent any of it being blown about, removed, and burned on a selected site well away from the camp. A considerable amount of dry rubbish and litter can be usefully disposed of by burning it in the latrine and urine trenches and over soiled areas of ground, and so utilising it as a disinfectant. Though litter and dry rubbish may be safely disposed of by burial in deep pits, the method is not to be recommended for refuse in general, which should always be burned. A convenient and effective method for disposing of refuse in standing camps is to throw up a small bank two feet high round a horseshoe-shaped piece of ground, on which the litter is first allowed to partially dry and then thrown evenly along the outside of the bank and ignited. The fire burns almost continuously and no nuisance is caused. On no account should litter or refuse ever be spread out on the ground to desiccate under the influence of sun and air, as a nuisance will certainly be caused, flies will be attracted, and there is a great risk of food and water becoming contaminated. All garbage and offal should be removed daily from kitchens and slaughtering places and burned at some distance from the camp. The environs of the encampment for a radius of 100 yards should be kept free from all avoidable surface pollution. Slaughtering places and other soiled areas of ground should be daily disinfected by burning litter over them. In stationary camps, Horsfall's movable destructors might be employed for the destruction of refuse—when fuel is easily obtainable.

Latrines and Urinals.—Immediately on the occupation of a camping ground, places well outside its perimeter and to leeward should be marked off by flags for the use of the men till the trenches

have been dug, so as to prevent as much as possible the indiscriminate surface pollution of the camp environs. These sites should be closed and cleaned as soon as the latrines are ready, and afterwards disinfected by burning dry litter on them, the excreta being deeply buried. Latrine trenches should in all cases be dug to leeward, in echelon on the outward flank of the camp, on a site not likely to be flooded by storm-water from higher ground, well away from the water supply, and, when the ground allows of it, at least 100 yards from the nearest tent, cooking-place, or slaughtery. It is always better to dig a few long trenches than a number of small ones, as they can be more easily supervised, and soil pollution is more limited. Accommodation should be provided for at least 10 per cent. of the strength of the force. In camps to be occupied for a single night the trenches need not be more than 2 feet deep, and no trench should be more than 2 feet wide at the top and slightly less at the bottom, the soil of which should be well loosened for a depth of several inches. A trench 20 feet long is sufficient for 100 men, and three, each 50 feet in length, will meet the requirements of a regiment. Shallow urine trenches, the bottom earth of which has been well loosened, should also be dug. When a camp is to be occupied for two or three days the trenches must be dug at least 3 feet deep, and for an occupation lasting a week or ten days the depth must not be less than 4 or 5 feet, since the use of shallow trenches will only result in a larger extent of soil pollution. All deep trenches must be filled in when the contents are about 2 feet from the top, and the earth should be well banked up over them so as to clearly mark their sites. To ensure the trenches being kept in a sanitary condition, the men should be particularly instructed to throw some earth over their dejecta before leaving the latrine, for which purpose a few scoops might be provided. The sweepers should be made to cover all exposed excreta by throwing a little loose earth into the trench three times a day; they should allow no soiled paper to blow about, and the pioneer on duty should make several daily visits to the latrines to see that these instructions are complied with. In camps occupied for more than a single night a shallow drain should be dug on the higher side of the latrine to prevent surface water entering the trench, which, if possible, should be sheltered with a light thatch roof. All latrine and urine trenches should be daily disinfected by burning in them a layer of dry litter three or four inches thick. The greatest care should be taken that all trenches have been properly filled in and banked over before the troops vacate the camping ground. To prevent unnecessary surface

pollution of the camp area, night latrines and urinals should be provided in all camps. They should be placed in the space between the perimeter and the outer line of tents on the side opposite to the cooking places, their position being denoted by a lamp or white post. In standing camps they ought to be worked on the removal system, the receptacles (empty kerosine tins) being taken into use at night-fall and removed at *reveille*, when the sites on which they were placed should be cleaned and disinfected with burning litter or chlorinated lime solution (1·5 per cent.). In camps occupied for only a night or two, or when receptacles are not available, a few broad, shallow trenches should be dug, filled with 3 or 4 inches of dry litter or, still better, wood ashes, and used as night latrines, their contents being removed and buried at daybreak, and the trenches disinfected; but only necessity can countenance this method. As soon as possible after the occupation of a standing camp by troops, steps should be taken to deal with all excreta on the removal system. The latrines ought to be roofed over to exclude rain, and protected by a shallow surface drain to prevent the ingress of surface water. Empty tins can be utilised as buckets. They should fit close under the seats, be completely boxed in, and if possible provided with a lid to exclude flies. A box for dry earth, with some scoops, should be provided for each latrine. The receptacles into which the buckets are emptied should always have close-fitting covers. Urinals can easily be extemporised from empty tins. A method that works very well, when attended to, is to bore some holes in the bottom of a tin and then almost fill it with *bhoosa* or sawdust, if it is procurable. The absorbent should be thoroughly stirred up every day, and will require to be replaced by fresh material once a week. The drainage from this urinal gives little trouble and is not offensive. It is very advisable to maintain a double set of buckets and receptacles for each latrine, as this will allow of their being disinfected every day, a process which can easily be effected by burning in them some dry litter or manure, over which a little kerosine has been poured. It is very necessary that some chemical disinfectant should be available for use in the latrines and urinals of standing camps. An acidified solution of chlorinated lime (1·5 per cent.) would be the best, since its cheapness, portability and recognised powers as a deodoriser and disinfectant more than counterbalance the drawback arising from its disagreeable odour. A very little of this solution placed in the latrine and urine pans would prove a great deterrent to flies. Day latrines and urinals should be located at least 100 yards from the

nearest tent or cooking place, and the ground about them must be kept in a clean and sanitary condition. The urine and excreta should be removed for burial in deep (at least 6 feet) trenches on some site well away from the camp. The daily increment of excreta must be covered with a layer of earth, the trenches disinfected by having a layer of dry litter, 3 or 4 inches deep, burned in them every day, and carefully filled in when the contents are within two feet of the surface. This system of removal works very well if carefully supervised, but is far inferior to the American Army trough method, in which milk of lime is utilised as a disinfectant, a plan which might with advantage be introduced into the larger standing camps.

When field operations have to be carried out in a country with an Arctic winter, all excreta and garbage from a standing camp should be disposed of by cremation. Otherwise, when a thaw sets in the nuisance caused by the exposed filth, which the frozen state of the ground prevented being covered at the beginning, would be appalling, as was demonstrated in Northern China.

Infectious Diseases.—The most important infectious diseases which occur in connection with British troops on field service in India are enteric fever, dysentery and cholera. The first is the scourge of modern armies, especially when troops are in standing camps. If a case occurs, the patient should be at once isolated and his feeding utensils, clothing and bedding carefully disinfected. The infected tent should also be disinfected, struck, removed, exposed for some days in an open place to the influence of the sun and wind, and its site left unoccupied. The feeding utensils, clothing and bedding of the other occupants of the tent should be cleaned, aired and disinfected, if necessary, and the men themselves should be kept under observation for a fortnight. Careful attention must be paid to the cleanliness of the camp area, latrines, urinals and trenches. If another case occurs, any overcrowding in the tents should be corrected, unnecessary fatigue and exposure prohibited, and strict attention paid to the proper protection of food and water supplies. When cholera occurs in camp, the patient should be isolated, the contacts segregated at a little distance from the troops, the infected tent, clothing, &c., dealt with as in enteric, and the neighbouring tents struck and pitched on a fresh site. If the contacts furnish a second case they must be again moved to a new site. All contacts must be quarantined for ten days. If the disease displays the least tendency to increase, all cases of diarrhœa and all men who are seen to frequently visit the latrine should be sent to

hospital for observation and treatment. Strict attention should be paid to the protection from pollution of food and water supplies, and to the general sanitation of the encampment. A case of dysentery is to be dealt with in a similar manner—as regards isolation and disinfection—to one of enteric. Contacts need not be quarantined, but if more than one case occurs in a tent it should be vacated, disinfected, struck, and removed to a fresh site, the original site being left unoccupied. When a tent has become infected by any contagious disease it should be evacuated, all clothing and bedding removed for disinfection, the poles scrubbed with a 5 per cent. solution of carbolic acid, and while still pitched, both the inside and outside of the tent should be thoroughly drenched with the same solution. The tent should then be struck, removed, and exposed to the sun and wind for ten days on some open site. The polluted tent area and its immediate surroundings should be well saturated with a 10 per cent. solution of chlorinated lime and, if possible, should not again be encamped on. Tents used for the treatment of any infectious diseases should be similarly dealt with. Every large standing camp should be provided with a Thresh's portable emergency steam disinfecter, or an Arnold's steam steriliser, for the disinfection of clothing belonging to cases of contagious diseases.

ON THE CAUSATION OF ENTERIC FEVER AT QUETTA, WITH SPECIAL REFERENCE TO CAMP SANITATION.

BY **LIEUTENANT-COLONEL J. BATTERSBY.**
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ON arrival at Bombay, February 4th, 1899, I received orders to proceed to Quetta and assume the duties of Special Sanitary Officer at that station. The previous year had been particularly unhealthy, as (with an average strength of 2,543) 232 cases of enteric fever had occurred amongst the European troops, with seventy-five deaths, the virulence of the disease being most marked during the usual period of seasonal prevalence, July to November. Since our occupation of Quetta in 1878, the station has had (until the last few years) an unenviable notoriety for the severity of its epidemics of enteric fever. For political and military reasons, Quetta must continue to be one of our most important stations in Baluchistan; hence the extreme desirability for making it one of the healthiest. The cause of this outbreak of enteric fever in 1898 was very thoroughly investigated, and was found to be undoubtedly due to the position of the old trenching grounds, which were situated to the windward of the barracks, about a mile to the north-west of the cantonments. The system of shallow trenches for the disposal of night-soil was wholly unsuitable for Baluchistan, where the average annual rainfall is about twelve inches. The cultivation of crops consequently depends upon irrigation channels, and as the sewage trenches were situated on more or less elevated ground, it was impossible to crop all the land. For some years this land had received the night-soil from the cantonments, including enteric and other germs. When the annual dust-storms commenced in May and June (more especially the so-called "dust devils"), clouds of dust-borne germs must have been blown over the cantonments, inevitably infecting water, milk, and all articles of food and drink exposed to air and dust, as the prevailing wind blew directly from the trenching grounds towards the barracks.

At this time the Royal Artillery and left British infantry lines were nearer to these shallow trenching grounds than the right British infantry barracks, and were placed more directly in the line of wind which carried clouds of germs from these dried-up and dusty trenching places. On tracing back all the available records

for the eight years prior to my appointment as Special Sanitary Officer, I found that during that period 114 deaths from enteric fever occurred in the Royal Artillery and left British infantry lines; while thirty-two deaths were registered from the right British infantry barracks, or those farthest away from the trenching grounds and less in the direct line of wind. It is worthy of notice that during this period women and children were affected in the same proportion as the men. The water supply was beyond suspicion, being conveyed by pipes from Urak, an exceptionally good and pure source, situated some fourteen miles from Quetta; and, although repeatedly subjected to bacteriological investigation, no single specimen of the enteric bacillus was ever found in it.

Lieutenant-Colonel Davies, R.A.M.C., the Sanitary Officer at headquarters, accompanied by Major Elliott, R.A.M.C., Command Sanitary Officer, paid several visits to Quetta during my sojourn at that station, and I take this opportunity of acknowledging the invaluable assistance they afforded me in solving abstruse sanitary problems, and the great benefit the station derived from their investigations. Writing of this epidemic, Lieutenant-Colonel Davies, whose views were very similar to those of the Senior Medical Officer and myself, stated: "I feel convinced that this (infection contained in the air) has been the principal channel of its conveyance, and that the main source of the poison was the filth trenches, though latrines, Native and European, may have been concerned as well; the cessation of cultivation of the trench area, combined with the absence of rain in 1898, has, in my opinion, established the fact of aerial infection." It seems unnecessary to remark that the system and the site previously adopted for the disposal of night-soil were at once changed. The infected area and shallow trenching grounds were, as far as possible, cultivated, and where this could not be accomplished, the dry and dusty surface of the ground was covered with litter, which was then burned, and every additional endeavour was made to destroy the *materies morbi* of the disease.

A new system of deep pits was introduced, and was found to answer admirably, pending the introduction of a water-carriage system and septic tank installation, which should prove a source of revenue to the cantonments if worked in conjunction with a sewage farm. I fear, however, that owing to financial considerations such a desirable project cannot be entertained for some time to come. The present site (at Sahabzada) for the deep pits is situated about three miles to the north-east of the British

infantry barracks, a point from which the wind seldom, if ever, blows towards the cantonments, and is approached by a good metalled cart-road. Each pit is 30 feet in length, 11 feet deep, and 7 feet in width, and receives all the night-soil (solid and liquid) of the cantonments for six days. The pit is filled up to 18 inches from the surface. A series of similar pits in line with each other are dug, each pit being separated from its fellow by a wall of clay about two feet thick, on the top of which a drain is cut 2 feet wide and 9 inches deep, which allows every possible overflow during wet weather to be discharged into the adjoining pit, and thus preserves the surface of the ground from pollution. These pits act as anaerobic chambers, as the surface of the contents is quickly covered with a thick scum of leathery consistence. Bacteriological action quickly reduces the solids to a liquid condition, while the hardy putrefactive organisms rapidly destroy the more delicate pathogenic ones. The latter are accordingly trapped, so to speak, in these pits, instead of being allowed to play their mischievous rôle in dry dust and shallow trenches. Besides, various gases are being continuously formed, which escape freely into the air. By this constant bacteriological and chemical action the contents of each pit practically disappear within a year, when the pits can again be used. Baluchistan is particularly well adapted for the disposal of sewage by means of these pits, as subsoil water is either absent or situated at such a depth as to render contamination impossible; the soil, too, permits of very little percolation. A special conservancy establishment is located at these pits at Sahabzada, where comfortable quarters have been built for the use of the sweepers. A good supply of pipe water has been laid on, and from six standposts all the receptacles and Crowley carts are thoroughly washed before returning to the cantonments. This washing is done on a brick and cement floor, and the dirty water conveyed by a surface drain to cultivated land.

Notwithstanding the many sanitary alterations and improvements that had been effected during the previous two years, another outbreak of enteric occurred in 1900, in the course of which 122 cases were admitted to hospital, of which twenty-nine proved fatal. In conjunction with the Principal Medical Officer, Colonel T. S. Weir, I.M.S., I made an exhaustive investigation into the cause of this outbreak, which, unlike its predecessors, did not make its first appearance in barracks, but in camp. As a prophylactic measure, summer camps had been formed for young soldiers; one for infantry was situated in a remote district, far

removed from native villages, and provided with an excellent pure water supply; the other, for Royal Garrison Artillery, was chosen by the authorities as affording the best site for practice, being situated at a convenient distance from the artillery range. This camp was near Baleli, in the Bostan Valley, and here enteric fever began in the month of July. After the third or fourth case had occurred the camp was moved to a new site at a distance of two miles from the former. The water supply was above suspicion, and was obtained from an artesian well of 120 feet in depth; still the disease continued to spread. A noticeable feature of both these artillery camps was the marked prevalence of dust-storms and "dust devils," which daily blew into the tents. The season (June, July and August) was reported to be an unhealthy one amongst the natives, and on visiting the surrounding villages we found many Pathans and their children suffering from a form of fever indistinguishable from ordinary enteric. Here, then, was a possible solution of the problem, as owing to habits and customs inseparable from the native population, the dusty soil and streams of water adjoining their dwellings must have formed sources of actual infection (I had a similar experience in last May, of a serious outbreak of cholera in a large village near Quetta, caused by an itinerant band of Brahuis camping for a night at the head of a village stream. These people had travelled up from Sind, where cholera was raging, and had, of course, brought the disease with them). The dust from these villages must have been charged with enteric and other germs, as everywhere it was visible, mixed with dried fragments of *fæcal débris*. About this time, too, I saw four natives who were suffering from undoubted enteric fever under treatment in the Mission Hospital at Quetta: of these, two died. The conclusion was therefore forced upon us that the disease was far more common among the Pathan population than had been at first anticipated, and that it was from such sources of infection that the disease spread to European troops by means of aerial convection. A marked feature of the outbreak in camp was the apparent tendency to spread from one individual to another, more especially amongst those occupying the same tent. This seemed to be due to personal contact and direct infection from man to man, and probably to indirect infection through contaminated clothing, bedding, soil, or possibly by flies. Typhoid bacilluria must also be a fertile source of infection, as the bacilluric condition is known to persist for a long period. Consequently, in a dusty

country the enteric bacilli, from this and other sources, are widely disseminated by the wind, infecting articles of food and drink, which, under the conditions of camp life, are necessarily more exposed to such infection. The common fly should also be regarded as a constant source of danger. During the Chitral Expedition of 1895 I was, I believe, the first to draw attention to this possible means of carrying disease by depositing the bacilli from bed-pans, urinals, latrines, filth carts, shallow trenches, polluted ground, or articles of clothing soiled with infected urine or fæces (see *British Medical Journal*, August, 1895). In camp, flies are ubiquitous and swoop down upon every article of food and drink exposed to their view. Unwashed raw vegetables, or fruits and vegetables washed in the wayside stream, must be looked upon with grave suspicion. The native bazaars, with their supper rooms and billiard tables, are also most undesirable places of resort. Here mineral waters are always exposed for sale, and although the contents of each bottle may have been originally derived from a pure source, yet my experience goes to show that if manufactured in the bazaar it is impossible to ensure thorough cleanliness. Soldiers frequently drink direct from the bottle, the neck of which had, a few minutes previously, been covered with flies; or perchance for cooling purposes the bottles had been placed in a chattie of dirty and probably infected water. There is grave suspicion that some of the cases occurring in barracks owed their origin to these eating houses, where pollution might possibly have occurred through leaky water pipes. The common hawker, too, should be prohibited from selling his goods in camp or barracks.

But to return to the Bostan Valley. I find it is a fact worthy of most careful comment that as surely as healthy troops camped or bivouaced temporarily in this valley during manœuvres or other military operations, between the months of June and November, so surely did enteric fever occur among them. So well recognised did this fact become that every endeavour is now made to prevent men camping within this area, unless the exigences of the service absolutely demand it. In addition to infected dust, the village stream, as already pointed out, is an undoubted source of danger. One most intelligent non-commissioned officer, who had been seven years in India, most positively attributed his attack to having drunk water three weeks previously from such a source; and last year, during an outbreak of cholera, I visited a village in which a woman washed the cholera-infected clothing of her child in the small stream which supplied drinking water to all her neighbours.

In presence of such illustrations, can any doubt exist of the paramount importance of pointing out to all new arrivals in India the absolute necessity of strict obedience in carrying out the rules and regulations drawn up for the preservation of their health?

With the experience of the artillery camp of 1900 fresh in our memories, we resolved to search for a new camping ground for the enteric season of 1901. About seventeen miles from Quetta a good site was discovered, remote from native villages, and provided with a sufficient water supply of excellent quality. Here half a battalion of each European infantry regiment was stationed during the summer, with the result that, although malarial fevers of a mild type were prevalent, enteric fever was conspicuous by its absence. In 1902 another summer camp was chosen at Mangal-Kot-Kotal, situated at a distance of twenty-four miles from Quetta, and also remote from villages. The water supply was excellent, and conveyed, by means of two-inch pipes, from an adjacent mountain spring. Six hundred young soldiers were camped here during the summer months, and not a single case of enteric fever occurred amongst them. The men for these camps were specially selected, bearing in mind the predisposing influences of youth, and of recent arrival in the country, as the period of greatest liability to attack for men is undoubtedly between 20 and 25 years of age. Under these circumstances the results of the experimental summer camps are highly encouraging.

These summer camps were not popular with either officers or men. They were too remote, afforded little shade, and were more or less monotonous. Transport, too, was attended with difficulties, as the main road was a considerable distance from camp. The beneficial effects, however, were so marked in diminishing the number of admissions to hospital from enteric fever, that it was decided to search for a more popular site for the summer of 1903. About sixty miles from Quetta lies the pleasant hill station of Ziarat, situated at an elevation of nearly 8,000 feet. Ziarat is the summer residence of the chief political residents in Baluchistan, and about two miles distant was an excellent water supply, known as "Lady Sandeman's tangi." We determined to explore this region, as examination proved the water to be of excellent quality, and sufficient during the driest season for the use of the troops proposed to be stationed there. The water was derived from springs high up in the uninhabited mountains, and falling down a steep rock, was received in a natural reservoir. Close to this water supply were ranges of low-lying hills, one of which we found to be

sufficiently level on the top for camping purposes, and affording ample shade from large juniper trees. From rough measurements we estimated that half a battalion of each European infantry regiment at Quetta, together with a garrison and mountain battery, could be accommodated on the top of this hill. The natural configuration of the hill, undulating towards the plain, made it possible to make satisfactory arrangements lower down for the battery mules, drivers, transport animals, slaughter-house, bakery, and all washing purposes. The site, on examination, proved to be a porous subsoil not encumbered with vegetation, and having a good fall for drainage. The elevation of this camp (about 8,000 feet) was lower than the origin of the water supply on the adjacent hill, consequently it was estimated that no difficulty would be found in carrying water by pipes to the highest point in the camp. With a little road-making the site was readily accessible to Ziarat for officers and men. We reported most favourably on the situation as a suitable one for a permanent hill station for the troops stationed at Quetta. The site was sanctioned for one season as an experiment, and orders received to prepare a camp for 1,200 European troops, with the usual complement of followers and transport animals. The Sappers at once prepared an excellent road about two miles long, connecting the main road with the highest point of the camp, which was also divided longitudinally and across by two broad roads. Separate sites were now measured for half a battalion of each regiment, and for the Garrison Artillery and mountain battery. In doing this, strict orders were issued that no trees were to be cut down, and that the tents were to be pitched between the juniper trees wherever most shade was afforded. I arranged that all night-soil should be removed by Crowley carts and deposited in deep pits, as we were doing at Quetta. For this most important purpose a suitable site was at once selected to the leeward of the camp, about a mile away. Sites for company and native latrines and urinals were also marked out, each latrine and urinal being supplied with a double set of glazed earthenware receptacles. No trenching whatever was allowed, and on the arrival of the troops, with their native followers, all conservancy arrangements were ready for immediate use. If these preparations are not made prior to the arrival of troops in camp the surroundings will inevitably become polluted. The adoption of the removal system for night-soil in camp enables the site to be handed over after three or four months in as clean and sanitary a condition as when first occupied. Cook-house water should be regarded as sewage and removed to separate

deep pits. Special Crowley carts and receptacles for the removal of cook-house water are reserved for this purpose and painted white. Ordinary washing water can be used for watering the plants and trees outside the camp. One or two small incinerators should be provided in suitable positions and all camp refuse burned in them. I have found an iron frame, somewhat similar to that used for the protection of young trees, with a grating near the ground, to act admirably for such purposes. The ordinary leather mussack was not allowed in camp. Water was conveyed from the source already described by means of two-inch pipes to specially constructed zinc reservoirs, impervious to rain and dust, over which a guard was placed for the protection of the supply and prevention of waste. From these reservoirs the water was carried to different parts of the camp by mules supplied with galvanised zinc pakhals, covered with thick felt, which, when damp, kept the water cool. Each unit brought a section of its regimental dairy from Quetta, so that all butter and milk used in camp were under constant supervision. Transport animals were located at the foot of the hill, and a separate branch water-pipe laid on for their use. Here, too, was chosen a suitable place for the slaughter-house, with special conservancy arrangements, including a small incinerator for the destruction of diseased livers, &c., a large percentage of which were affected with fluke. An excellent site was also selected for the commissariat supply depôt and bakery. Field-ovens were used, and the bread baked was invariably of excellent quality.

About half-way up the hill, in the shade of the juniper trees, an improvised bathing place was constructed on a level piece of ground about twelve feet square, from which the earth was dug to the depth of a foot and a half; into this space a large tarpaulin was fitted, and as the water tap was close by, the bath could be filled by means of buckets, and dirty water disposed of among the trees. Special sanitary rules were drawn up and printed for the use of each company cook-house, which prevented slops and refuse from being thrown about. The neglect of this simple order is the chief attraction for the swarms of flies so frequently seen in and about cook-houses. Copying the custom of the Pathans in the hill districts of Baluchistan, both officers and men soon constructed most comfortable arbours (called by the natives "juggies"). These were erected under the shade of large juniper trees, the walls consisting of juniper branches, and were much cooler and pleasanter to sit in than tents during the hot part of the day. The camp afforded

excellent opportunities for military training, and being close to Ziarat, was popular with officers and men. A recreation ground was formed for cricket and football, while Ziarat was available for tennis and the usual social functions of a small hill station. During the season two officers contracted enteric fever; one from drinking water at a distant village while out shooting, the other owed his illness to having drunk water from an unknown source on the march from Quetta; but not a single case occurred among the men. The season was an exceptionally unhealthy one with the civil native population, as typhus fever and cholera were prevalent from May to September. The general health of the troops, however, remained very good. I have no hesitation in stating, from my experience as Sanitary Officer, and for more than two years as Senior Medical Officer at Quetta, that the summer camps contributed largely towards the marked diminution of enteric fever and the satisfactory results obtained in the general health of the European troops.

AN UNDESCRIBED ERUPTIVE FEVER.

BY MAJOR W. MOULD.

Royal Army Medical Corps.

THESE notes of cases which I saw in the Sierra Leone Protectorate in 1898-99, and which I have not understood, may lead to other medical officers recording experiences similar to mine, or possibly my observations are faulty. As they were made in the bulk during a campaign they are necessarily scanty, and were made hurriedly.

Soon after my arrival at Port Lokko, the base of the Karene Field Force, in May, 1898, a considerable number of Mendi carriers were sent down from the moving columns or came sick from the convoys on the lines of communication with small-pox. These men I had isolated in some huts away from the port under the charge of a headman, and as far as possible were kept to themselves. I was overwhelmed with work at the time, being alone with many sick and wounded, and did not give much attention to these cases, and while I was there only one proved fatal. I found, however, that the headman, an educated Sierra Leone native, scarred by small-pox, had himself separated them into two groups in the huts; one group he called "small-pox boys," the other group "cow-pox boys." The first group were few in number and were undoubted cases of small-pox. The "cow-pox boys" were mild cases, the men not being ill, the eruption was not pustular, and they soon recovered. I thought at the time that they were cases of chicken-pox in Negroes of a severe type, and kept the two classes apart.

Later in the year, when at Karene, I saw in the *British Medical Journal* an abstract of a paper read at the Glasgow Medico-Chirurgical Society, describing cases in Lascars who had been sent to a small-pox hospital on the Clyde, but on admission the diagnosis was doubted and the patients were successfully vaccinated and their illness ran a natural course. The reader mentioned that similar cases had been recorded in natives in South Africa. The Colonial surgeon at Karene, in the course of conversation, told me he knew of the cases called cow-pox by the Sierra Leonians, who he said differentiated (1) small-pox, (2) chicken-pox, and (3) cow-pox, and he had seen cases of all three. Soon afterwards I had two cases of small-pox amongst a detachment of the West African Regiment (natives of the Coast), and was on the look out for more,

when the case narrated below came under my notice. A column of the West African Regiment had left Karene on December 12th, and four marches out, on the morning of the 17th, a man reported sick to the medical officer of the column, who diagnosed small-pox and sent him back to Karene with a note for me. My notes are as follows :—

Lance-Corporal Davidson, West African Regiment, an intelligent, missionary-educated Mendi, who gives his age as 24, and has no marks of vaccination or small-pox. He says he had a rigor on the night of December 16th, and a rash came out on the morning of the 17th, when he reported sick and was sent back to Karene, where he arrived on the morning of the 19th, having come upwards of forty miles in two days, and sleeping at villages for the nights, showing he could not have been very ill. On arrival he had no temperature, complained of no pain and said he had none, nor had he felt ill since he went sick. The tongue was furred. The face, eyelids, and nostrils were swollen. The face, upper extremities and trunk, were covered by a rash, also a little on the lower limbs; this rash itched intensely, and was thickest on the face where it had first come out on the forehead. It had come out in crops, commencing as small papules, which were superficial and not shotty, and about the third day vesicles formed on the papules. At first sight it looked like a case of mild variola, but the man said he had not been ill since the initial rigor which preceded the rash; there had been no pain in the back, the rash had come out on the first day of the illness, the papules not shotty and the vesicles unilocular. It did not appear at all like chicken-pox, and the Colonial dispenser, a Sierra Leone man, trained at Freetown, said it was cow-pox.

December 20th.—No fever; bowels have acted well after a dose of castor oil. A few fresh papules have come out, and some of the vesicles are drying up. There is no rash on the mucous membrane of the mouth, &c. The Colonial surgeon saw him with me, and agreed that it was not a case either of small-pox or chicken-pox, but was what the natives called cow-pox.

December 22nd.—Patient quite comfortable. He is isolated with a man to bring him food and water, but otherwise holds no communication with him, and is sponging himself with lotion acid (carbolic, 1-40). Vesicles are drying up except a few on the face, which have become purulent as a result of his irritating them; none of them are umbilicated. All swelling of the face, &c., has subsided.

To-day a true case of chicken-pox has occurred, a case quite

different from this man, and the Colonial surgeon has confirmed the diagnosis.

December 24th.—Man well. Vesicles have dried up, except those few on the face which became purulent.

December 27th.—All vesicles dried up, and scabs falling.

January 1st.—Man quite well ; only two scabs remain, and there is no pitting.

I left Karene on January 8th, no other case of eruptive fever having occurred, and I heard again a month after that there had been no fresh case of any sort.

This is an isolated observation, but I think worth recording. No Royal Army Medical Corps officer on the Coast whom I met knew about "cow-pox," but this is hardly to be wondered at, as until 1898-99 the troops had all been West Indians except a few Europeans, and it was only in that year that natives of the Coast were enlisted for service and so came under our notice. This may lead to further enquiry, and perhaps a "new disease" may be found to exist on the West Coast of Africa amongst the natives.

WITH THE SIKKIM TIBET MISSION FORCE.

BY CAPTAIN C. W. MAINPRISE.

Royal Army Medical Corps.

ON November 13th, 1903, I received orders to proceed immediately to Calcutta and mobilise Section D, No. 21 British Field Hospital for service with the Sikkim Tibet Mission Force. At the time I was doing duty in the Station Hospital, Barrackpore.

The section was quickly mobilised, and on the afternoon of Sunday, November 29th, we left Calcutta for Siliguri, where we arrived early the next morning. Here we waited one day, equipping the hospital establishment with the special Tibetan scale of clothing, and the following day we proceeded to Rungpo, four days' march from Siliguri. This march was an easy one, as the country is here fairly flat, and we passed along through the Teesta Valley, which is most beautifully wooded and quite a pleasure to one who had lately arrived from the plains of India. We followed the course of the Teesta river the whole way, and thus had no difficulty in the matter of drinking water. Our transport, which was mule, kept up a splendid pace, and provided they were not allowed to rest on the way we had no difficulty. Unfortunately, on our first day's march, after marching about six miles I called a "halt," and to my horror immediately several mules began to lie down, the hospital boxes became unfixed, and one box went rolling down a *khud*, appearing as if it would be smashed to pieces every moment. However, it was subsequently recovered, and appeared sound, though I was afraid to look at the contents inside. After this catastrophe there were no more halts for the mules.

On arriving at Rungpo I found orders to wait until we received further orders. The Mission and escort at this time were at Gnatong and were awaiting sufficient transport and supplies to proceed over the Jalap Pass to Phari and Tuna. At Rungpo our Army Bearer Corps men were replaced by thirty Tibetan doolie bearers, who had been recruited mostly at Darjeeling, and the arrival in camp of these men I shall never forget. They were dressed in any clothing they could pick up at Darjeeling, mostly ladies garments, and the sight of a Tibetan in a saucy sun bonnet with red strings and a lady's dressing jacket as a coat, with ordinary trousers, was too funny. However, these Tibetans were excellent fellows and would work and sing all day long. They

will do anything for a *sahib*, but do not like to be ordered about by a native.

On December 11th we heard of the advance of the Mission and escort from Gnatong into the Chumbi Valley, but to our regret no mention was made of the British Field Hospital. So evidently the General did not think there would be any serious opposition on the part of the Tibetans, and as transport was very scarce we had to remain behind. As subsequent events proved, the Mission met with no opposition and were safely escorted to Tuna, and left there with a small escort. The General and most of the troops returning, some to Phari Fort, some to the Chumbi Valley.

On December 30th I received a telegram saying my hospital was urgently required at Chumbi ; so on January 1st we started off. Unluckily not sufficient mule transport was available, and we had to move by bullocks. It was only when we began to load up that I began to see our difficulties. Directly a bullock was loaded up off the beast started, tail in air, snorting vigorously, and in a short time—well ! it was ready to be loaded up again. Again and again this happened, and I began to think we should never load up. Bullocks loaded with hospital boxes were the worst. The rattling of the contents of the boxes nearly drove the animals wild, and when I saw the boxes thrown off, I imagined myself arriving at Chumbi with a few fragments of food and a few broken bottles, all that I could collect of our once smart and trim hospital. Alas ! for my commission. However, our Tibetan doolie bearers came to our assistance nobly, and by holding on to the horns of the animals for some time, gradually the beasts got accustomed to the load, and we got on better.

The first march from Rungpo to Roratum (nine miles) is an easy one, but next day it was not so good. My diary says : “ Started for Lingtam (twelve miles) ; bullocks again our transport ; had a very trying march, as not only was it mostly uphill, but the bullocks gave no end of trouble, the loads continually slipping off, or being kicked off and delaying us.”

Next day Coolies were provided for us and proved ever so much more satisfactory than the “ biles.” The march of about eleven miles was very severe. It was impossible to ride at all as the path was too steep and irregular ; lined with paving stones of a kind. Late in the afternoon we arrived at Jaluk, a most dreadful spot, and very bad camping ground, on the sides of a hill. I had ridden on to look for the camping ground and found Jaluk enveloped in a cold thick mist. None of the hospital had arrived, so I set to work and lit a fire. As my diary says, “ I never felt so cold and miserable

in my life." The hospital establishment eventually straggled in, very tired and exhausted, and altogether we were very glad to have some supper and get to bed. We were now some 10,000 feet above sea-level, and next day had our march to Gnatong, the stiffest climb of the whole journey. The road for the first four miles is very steep indeed, and our men were feeling very much the effect of the rarified air. After every few paces they had to stop to take breath and to relieve the sense of suffocation they were experiencing. Some complained much of a "splitting headache," others had a feeling of "nausea," whilst others would have felt all right had it not been for this difficulty of breathing.

After the first four miles the road was more or less downhill, and we eventually arrived at Gnatong (about 12,400 feet). It was bitterly cold here, with a nasty cold, cutting wind, which made us use the hospital boxes as a barricade against the wind. However, some afternoon tea, and later a good dinner before a blazing fire at the 8th Gurkha's mess, made me look at things more cheerfully, though I still had the night before me.

Sleeping in a tent in the open at Gnatong is no small experience in the month of January, with a gale blowing and a temperature 20° below freezing. My hospital staff had evidently been warned of this, because soon after arriving both my assistant surgeons and my hospital storekeeper asked permission to sleep in the fort that night, as they had found friends who owned huts and fires, and these luxuries they had been invited to share. As we had no patients I consented, contenting myself with the thought that I was all the greater hero. That night I slept (?) with all my clothes on, save a Balaclava cap, instead of my helmet, and yet was too cold to sleep. I had a waterproof and three blankets underneath me, and four blankets, including a thick Tibetan blanket, above, to say nothing of all spare clothing I could lay my hands on. The wind was blowing so hard that I thought the tent would have been down upon me every moment; but I did not care, as I thought, at all events, this will be another covering! However, like all things, the night came to an end, and early next morning we began to pack up for our march to Kapup, a short march of six miles only. Here we arrived after a fairly easy march, but in the afternoon the wind again began to get up and the cold was bitter. That night my assistant surgeons said it was the worst they had ever experienced, but as they had not slept out at Gnatong, I do not think they were competent to judge. I, at all events, possibly through the severe training of the night before, slept better than they did. Hence virtue has its reward.

Next morning my senior assistant surgeon complained of mountain sickness, could eat no breakfast, and the sight of a cigarette nearly made him faint. This was not a good condition in which to start to cross the Jalap Pass. After a late start, due to the lack of sufficient transport (Coolies), we began to ascend the pass (Jalap) so much talked about. At first the path was very steep but rideable, later on too rough and irregular for riding. At the top my assistant surgeon and myself thought that we would stop and admire the view, but we found this impossible. In spite of our poshteens and warm coats underneath, the wind seemed to blow right through us; and the difficulty of breathing made us glad to hasten down the opposite side and wait for the rest of the hospital, who came over in ones and twos, all greatly distressed, but only too glad to hear the worst of the pass had now been completed. The road down from the pass was very bad, in fact, "road" is too dignified a title for such a path, and it was a case of simply jumping from boulder to boulder. We encamped at Langram, the camping ground being really a portion of the dry bed of the river.

That night we had to send out our doolie again up the hill for three miles to bring in an officer commanding a mule corps, who had been seized with mountain sickness and was unable to get into Langram. However, when the doolie arrived this officer had already pitched his tent and gone to bed, from which he absolutely refused to budge, saying that all he required was to be left alone. So our tired doolie bearers had their journey for nothing.

Next morning we started on our final march to Chumbi Camp, passing through the famous Chinese Wall at Yatung, the supposed trading place by treaty of the English and Tibetans; but where, with the exception of Miss Anne Taylor's (the lady missionary of Tibet) store for drugs, general stores, &c., there were no signs of trading of any sort. Again passing through more Tibetan villages, whose curious inhabitants looked very inoffensive, in fact, rather glad to see us, we reached the Chumbi Valley. The valley rather disappointed us, as we had heard so much of its fertile and smiling appearance; but from what we could see it looked anything but fertile, being rather barren and bare. However, this was January, and the valley has since made amends. We soon arrived at the camp, pitched our tents and made ourselves snug, as we heard that we should probably remain here some time.

Of our stay in Chumbi and of our advance to Gyangtse, and of the fights at Guru and Red Gorge, I must tell in another number of the JOURNAL.

Clinical Notes.

NOTES OF A CASE OF CHRONIC INTUSSUSCEPTION SIMULATING DYSENTERY.

BY CAPTAIN K. BRUCE BARNETT.

Royal Army Medical Corps.

PRIVATE L., aged 24, was admitted to hospital with varicose veins in the legs, but refused operation. While in the surgical division he complained of passing blood per rectum, and came under my care.

Personal History.—The patient stated that he suffered from dysentery in South Africa in 1902, and that he had frequently attended hospital for chronic symptoms of the disease. He had also suffered from chronic constipation, and was in the habit of using purgatives. He said that he had been passing blood in the same way for months. This troubled him so little that he did not complain of it until he had been in hospital for some weeks, and was going to be discharged as he refused operative treatment for the varix.

His "medical history sheet" showed an admission for "dysentery" in South Africa in 1902, when he was thirty-five days in hospital, and was treated by salines. He had also an admission at Aldershot last year for "ulceration of the rectum," when he was forty-seven days under treatment, but no particulars are given in confirmation of this diagnosis. No history of syphilis could be detected. There was no temperature. A rectal examination showed an absence of stricture, piles, ulceration, tumour, &c., or of anything to account for the loss of blood.

Stools.—These were found to be fluid, or semi-fluid, and to contain usually blood-clots and fluid blood in varying quantity. There was also some mucus, and shreddy matter looking like sloughs, but no pus. The odour was disagreeable. Occasionally there was no blood in the stools first passed in the morning, the subsequent ones being almost pure blood. From this fact it was inferred that the ulceration—as the case was looked upon as one of some form of intestinal ulceration—must be fairly high up the great gut, or possibly in the cæcum. At no time was any solid motion passed. The number of stools passed in the twenty-four hours varied from one to six or eight, and the quantity from a few ounces to two or three pints. The urine was normal.

General Condition.—The other organs and functions of the body appeared to be normal. The tongue was clean, and there was no rise of temperature. The patient was dark and anæmic, felt hungry, had no sickness at first, but suffered from sleeplessness. The abdomen was rather empty and retracted, but nothing could be felt on palpation. At

DESCRIPTION OF FIG. 1.

Twenty-two inches of small intestine divided into two parts by line H—H.

The arrows indicate the track of the intestine.

The portion of the bowel above H—H is the intussusceptum; the portion below H—H the sheath or intussusciens.

A small knuckle of the intussusceptum, C D E, is left intact, cotton-wool being inserted in the lumen at C and E. This knuckle of intestine is seen better enlarged in fig. 2.

DESCRIPTION OF FIG. 2.

The knuckle of intussusceptum enlarged from fig. 1.

B F, showing intestine, which is laid open, to be swollen and much inflamed.

C D E, the knuckle itself, partly filled with cotton-wool. Notice the enlarged cut ends of the bowel, which are considerably increased in the coats. The bowel is in a stage of gangrene and very congested. The walls of this piece of intestine were fully three-quarters of an inch in thickness. It was found so closely in contact with the sheath that it had to be peeled off. The whole mass before being disengaged from the sheath was found to feel like a solid bloody tumour. The lumen of the bowel was so contracted as just to admit a penholder.

G G, mesentery.

The photo from which these blocks were prepared was kindly taken by Dr. J. F. Briscoe.

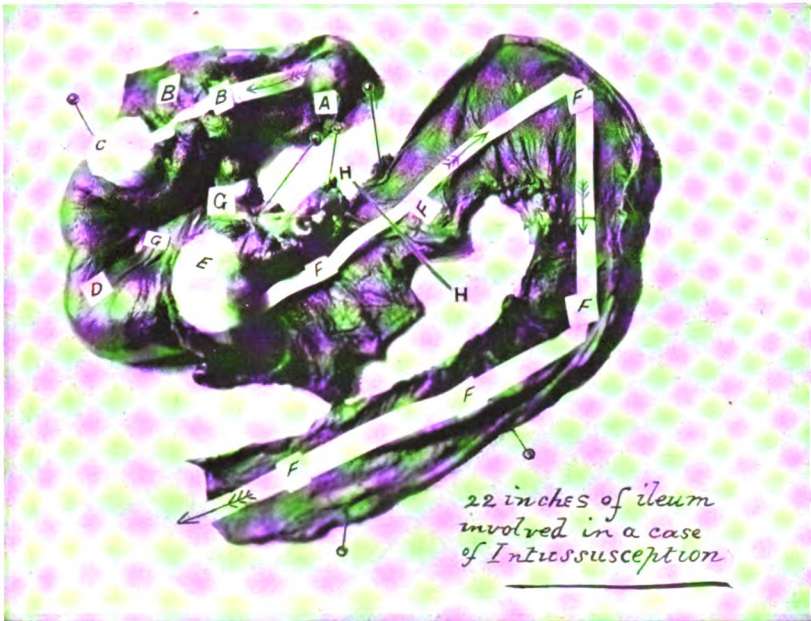


FIG. 1.

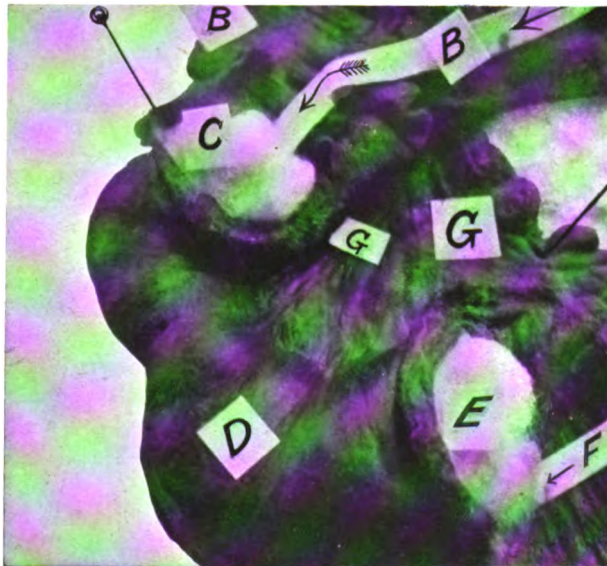


FIG. 2.

To illustrate paper by Captain K. BRUCE BARNETT, R.A.M.C.

times there was a little abdominal pain, which varied in position, and was never a prominent symptom. Tenesmus was sometimes complained of immediately before stool, but did not continue in the intervals.

Treatment.—The patient was very carefully dieted on peptonised milk, strained soups and beef juice, and was ordered gr. x. to xx. pulv. ipecac. four times a day, combined with a little extract of belladonna, 15 minims of tr. opii. being given a short time before, according to the usual, and successful, Indian method of treating dysentery. The bowels were also acted upon by small repeated doses of calomel, castor oil, mag. sulph., &c., and he always felt relief after these. An astringent mixture containing turpentine, hamamelis and gallic acid was also used when the blood passed seemed excessive.

As this treatment did not produce the desired result, the lower bowel was frequently washed out with hot boracic acid solution, after which nitrate of silver (gr. $\frac{1}{2}$ ad. $\frac{3}{4}$.) injections of one to two pints were given with tube and funnel twice daily. For a time he appeared to improve a little under this treatment, and expressed himself as feeling much better. The pain at stool also disappeared. He was a good deal troubled with sickness and retching, which was attributed to the ipecacuanha. The stools became less in number, contained more faecal matter, less blood, and were not so offensive. He slept better, but appeared to be losing flesh.

On June 17th, after being about two months under treatment, he became much worse, vomited frequently during the day, and had severe pain in the abdomen. The stools numbered seven, and were small, dark, and very offensive.

On the 18th there was no action of the bowels, and no flatus passed; vomiting continued at more frequent intervals, with severe epigastric pain. Several hypodermic injections of morphia and hot fomentations were used to relieve this. The abdomen was flaccid and retracted; there was no distension or swelling in any part, or sign of peritonitis. No tumour could be made out on palpation, and the pain was not confined to any one spot.

On the 19th the signs and symptoms of acute obstruction became more marked, no fluid could be kept in the stomach, and there was also hiccough and great restlessness. The temperature, which had all along been normal, fell to 97°. A large, fluid, tarry stool was passed, which consisted of pure blood, and dark blood of the same character was vomited many times during the day. Restlessness increased, the face was pinched, the skin cold and clammy, the pulse rapid and weak. There was little or no pain. Stimulants of every kind were tried, including the intravenous injection of O iii. hot normal saline solution, but the condition of collapse became worse and he died early on the morning of the 20th.

Autopsy.—On opening the abdomen there was no sign of any peritonitis.

The stomach and intestines down to about ten inches above the ileo-cæcal valve were slightly congested, but otherwise normal. From this point down to the valve a well-marked, sausage-shaped intussusception of the ileum was found, dark blue in colour generally, but grey in places. On carefully dissecting this mass, which was almost circular in shape before being removed from the body, the usual layers could be traced. It was almost solid to the touch. The layers were with difficulty peeled away, and when incised a quantity of bloody fluid escaped. The bowel was in a state of gangrene. The layers of the invaginated portion of intestine were well agglutinated, and on the outer layer a fine, sandy, granular appearance presented itself. Owing to the extreme congestion it was impossible to say whether the lumen of the bowel was completely blocked at the time of death. Certainly, medicines given by the mouth a few days before death appeared to have acted on the lower bowel. The intussusception was immediately above the cæcum, which was in no way implicated and, together with the appendix, was normal in appearance. The large intestine, including the rectum, was more or less congested and filled with a dark, tarry, and offensive fluid. No solid matter was found in any part of the alimentary canal. There was no ulceration in any part, and the whole intestinal canal was carefully searched for this condition; neither was there any sign of old ulceration. The other organs of the body presented nothing to note. The liver was normal in weight and structure.

Remarks.—This case is of interest as presenting during life the symptoms of chronic dysentery in a young adult, which did not improve under prolonged dietetic and medicinal treatment. The cause of death was evidently acute obstruction of the bowels, and the results of the *post-mortem* examination prove beyond doubt that there was a well-marked intussusception of ileum into ileum, and no signs of ulceration in the great or small intestine. The case appears to be one of some rarity, and I do not know if a similar one has been recorded.

REPORT ON A CASE OF MALIGNANT NEW GROWTH OF THE
TIBIA, FOR WHICH AMPUTATION OF THE THIGH WAS
PERFORMED.

By MAJOR C. E. G. STALKARTT.

Royal Army Medical Corps.

No. 6746 Private J. Pushee, 1st West Riding Regiment, was admitted to the Royal Infirmary, Dublin, on January 20th, 1902, as a transfer from Mullingar.

History.—The patient, whose age was 19 years and 8 months, and service five months, stated that while at the depôt of his regiment (at Halifax,

Yorks), in August, 1901, he fell downstairs and knocked his left leg below the knee-joint, and that owing to pain in the part he was on light duty for a few days. In October, 1901, he came to Mullingar, and on the 16th of the same month he was examined as to his fitness to undergo a course of gymnastics, but owing to pain in the left leg he was excused and put on light duty. About this time he noticed a swelling at the inner side of his left knee, and which, since then, continued to increase in size. He was in hospital at Mullingar for a few days in November, 1901, and in December, 1901, for the same trouble.

Condition on Admission.—The patient was thin and debilitated; there was an ovoid, diffuse swelling over the inner tuberosity of the head of the tibia (left), measuring about 4 inches in a vertical direction and involving the inner and posterior aspects of the bone; the swelling was firm, but tending to soften in parts, somewhat elastic, slightly tender to deep pressure, and presented dilated veins over its surface. The circumference of the leg below the tubercle of the tibia was $14\frac{3}{4}$ inches (on January 28th, 1902). A diagnosis of "periosteal sarcoma" having been made, the patient was advised to undergo amputation of the thigh, but he refused and wished "to wait and see how he got on." On February 12th, 1902, the circumference of the leg below the tubercle of the tibia had increased to $15\frac{3}{4}$ inches, and the patient's health had further deteriorated; however, he still refused the operation. On February 18th, 1902, the patient's consent having been now obtained, amputation of the thigh at the junction of the middle and upper thirds was performed (by postero-external and antero-internal flaps of the skin and subcutaneous tissues, and circular division of the muscles and bone higher up). Union of the flaps by first intention took place, and the patient made an uninterrupted recovery from the operation and was allowed up on crutches on March 4th, 1902, with a firmly-healed wound and a stump quite satisfactory as to the position of the scar and the absence of pain and tenderness on manipulation. He was recommended to be supplied with an artificial limb, and was invalided out of the Service.

Examination of the tumour showed a typical sarcomatous growth, very highly vascular, invading and eroding the bone deeply and encroaching on the surrounding tissues.

Subsequent History.—It was ascertained that on June 18th, 1902, this patient was admitted to St. Mary's Infirmary, Highgate Hill, London, suffering from symptoms of undoubted secondary infection of the lungs.

I was indebted to Civil Surgeon Meldon for kind assistance at the operation.

REPORT ON A CASE OF NECROSIS OF THE FEMUR, FOR WHICH SEQUESTROTOMY WAS PERFORMED.

BY MAJOR C. E. G. STALKARTT.

Royal Army Medical Corps.

No. 9816 Corporal A. A. Fowler, Army Service Corps, was admitted to the Royal Infirmary, Dublin, on July 1st, 1902, for necrosis of the left femur.

History.—The patient, whose age was 32 years, and service eleven years and four months, stated that he went to South Africa on November 1st, 1899, and was quite well there until June, 1901, when, owing to some inflammatory condition about his chin, he was sent from Burghersdorp to No. 1 General Hospital at Wynberg, and that while in hospital there pain in his left thigh came on. He was discharged from hospital, but the pain got worse in his thigh, and he was admitted to No. 5 General Hospital at Wynberg, where he remained for about two months, the trouble in his thigh continuing to grow worse all the time, until in September, 1901, he was invalided home (for rheumatism). His condition improved on the voyage, and after landing in England he was sent to Cambridge Hospital, where he remained for about one month, and then proceeded on sick furlough for three months. At the expiry of his furlough (during which he had no medical treatment) he rejoined his unit at Dublin on January 10th, 1902, and continued doing his duty until July 1st, 1902, on which date, after presenting himself for examination as to his fitness to re-engage, he was found "unfit for service," and was admitted to the Royal Infirmary for necrosis of the left femur.

His family history was good, and no history of specific disease or of tubercle could be elicited, but he is said to have had a mild attack of typhoid fever in December, 1896. On admission to the Royal Infirmary his condition was as follows, viz., the left thigh was much thickened, the enlargement involving its upper two-thirds; two sinuses exuding a purulent discharge existed on the postero-external aspect of the thigh, one opening being 4 inches and the other $6\frac{1}{2}$ inches above a line drawn round the thigh at the level of the upper margin of the patella.

CIRCUMFERENCE OF THIGHS.

					Right.	Left.
At a level of 4 inches above the upper margin of patella	..				14 $\frac{1}{2}$ in.	14 $\frac{1}{2}$ in.
" 6 "	"	"	"	"	16 $\frac{1}{2}$ "	18 $\frac{1}{2}$ "
" 10 "	"	"	"	"	17 "	18 "
" 12 "	"	"	"	"	19 "	19 $\frac{1}{2}$ "

Probes passed into the sinuses took an upward and outward direction for some inches in the soft tissues of the thigh, then entering cloacæ in the bone, finally reached the central cavity of the femur, where dead bone could be felt.

The patient was very anxious to be operated on, though warned

that convalescence would, at best, be very protracted after the requisite operation. On July 11th, 1902, the operation of sequestrotomy was done under ether. The limb having been rendered bloodless (by means of an elastic bandage and a tourniquet applied above it), a vertical incision 6 inches long was made through the soft tissues over the site of the sinuses and extending upwards on the limb; the bone was freely exposed and found to be much thickened and indurated, with a roughened surface and riddled by several cloacæ. The eburnated bone was with difficulty chiselled and gauged away longitudinally between the cloacæ for 3 inches and the central cavity exposed. Several long sequestra were removed from the interior of the shaft of the femur, together with much bone *débris* and ill-formed granulation tissue. The central cavity, which extended both up and down the shaft for some distance, was thoroughly scraped out and irrigated with hot antiseptic lotion, and the whole wound subsequently tightly packed with sterilised gauze and firmly bandaged up before removing the tourniquet.

The immediate result of the operation was a fall in the evening temperature, which had previously been of a hectic type. The after-progress of the case was of necessity very slow, tedious and protracted; repair of the bone and the closing of the wound in the softer tissues took place very gradually. The patient remained in hospital for nearly three months, towards the latter part of which symptoms of fresh trouble in the upper third of the femur began to develop. The patient was very loth to undergo any further operative treatment, and having been invalided out of the Service, at his own very urgent and repeated requests he was discharged from the Royal Infirmary on September 26th, 1902.

It was ascertained that the patient applied at the Meath Hospital for further treatment and is still under advice there. I was indebted to Civil Surgeon Meldon for kind assistance at the operation.

AN INSTANCE OF TRICUSPID REGURGITATION.

BY CAPTAIN J. H. P. GRAHAM.
Royal Army Medical Corps (Militia).

TRICUSPID insufficiency due to organic lesions is regarded as one of the rarer forms of valvular heart disease, particularly so when such lesions are due to a chronic sclerotic process rather than consequent on an acute endocarditis; even when due to functional disturbance it is generally considered to be of infrequent occurrence.

Speaking of the functional disorder, Gibson, however, dissents from this view, and says that "it is incomparably the most common of valvular lesions." He supports his contention by saying that as the condition does not seriously impair the circulation it usually escapes observation unless especially looked for.

The determining cause of relative insufficiency is the existence of increased resistance to the blood flow in the pulmonic circulation of sufficient degree to stretch the tricuspid ring, it giving way rather than the pulmonary, owing to the greater strength of the latter. Such increased resistance is brought about by a variety of conditions, some local, others remote, which it is needless to enumerate here; suffice it to say that in the case under consideration none of the usual causes could be found in operation. In the absence of a more obvious cause it is attempted to explain the condition by assuming that some cause, probably functional, was temporarily in operation, whereby an overfilled state of the capillary system was brought about, inducing in consequence a much increased strain on the heart; and that the valvular ring capable of least resistance gave way, exhibiting a "safety valve" action. It would not be necessary for the pressure to arise primarily in the pulmonic circulation to thus affect the tricuspid valve, increased resistance in the systemic circulation would affect it rather than valves nearer the point of pressure, owing to their greater powers of resistance. Two physiological facts seem to lend support to this conjecture: that any increase in the quantity of blood raises blood pressure, and that as the pressure rises in the arterial system it falls in the venous. The somewhat bloated condition of the patient on admission, and the rapid disappearance of signs of circulatory embarrassment which took place as the very free diuresis came on, seem to point to vascular plethora. A fall of pressure in the venous system would undoubtedly favour regurgitation from the right chambers of the heart, and explain an accentuation of the murmur when the patient assumed the recumbent position.

A patient was admitted to the Station Hospital under the care of Lieutenant-Colonel O'Connell on February 11th, 1904. Complaint was made of pain about the lower costal zone, and particularly in the right hypochondrium, of a few days' duration, cough, and swelling of the legs.

The patient was a stout man of sallow complexion, and looked at least ten years older than his stated age, namely, 31 years. The tongue was furred and he was constipated; the abdomen was somewhat distended, but no free fluid could be detected; spleen not enlarged. There was slight tenderness over the liver, and very marked pulsation of an expansile character which could be traced round into the flank. The urine was much diminished in quantity, only $1\frac{1}{2}$ pints being passed in twenty-four hours after admission; it was darker than usual and deposited a slight cloud on cooling; specific gravity 1012, acid. No albumen nor bile pigment was present. There was cough and expectoration of a small quantity of watery mucus; the vesicular murmur was somewhat increased and the chest sounded as if hypertrophic emphysema existed. The area of cardiac dullness (superficial) was increased in slight degree upwards and was continuous below and to the right with the hepatic dullness. There was a murmur, systolic in time, heard at a spot close to the sternum

at its lower end, very limited in area, and propagated only a short distance vertically. There was very marked pulsation in the veins of the neck, the radial pulse was full and not easily compressed. The legs were cedematous from the knees to the ankles. The patient was kept in bed, given a plain milk diet and one pint of soda-water each day; a dose of soda sulphates each morning, and ferri et ammon cit., grs. v., thrice daily. Under this treatment free diuresis ensued, the patient passing 6, 6, 7, 5, $4\frac{1}{2}$ pints of urine on the five days subsequent to admission; this urine was normal. The heart murmur had disappeared by February 16th, being best heard in the recumbent position; it was then replaced by reduplication of the first sound at the apex, which eventually became natural. The cedema of the legs, the abdominal resistance and fulness of the face, together with the hepatic and venous pulsation, gradually subsided, and on February 29th the man was discharged to his duty. It may be added that the man admitted being a free liver.



REPORT OF THE ROYAL COMMISSION ON THE WAR IN SOUTH AFRICA.

As the actual volumes of this important report are unlikely to be accessible to the majority of members of our Corps, while the evidence contained in their pages cannot fail to be of interest to our readers, we propose giving a *précis* of the evidence so far as it relates to medical organisation before and during the late campaign. For this summary, which is continued from p. 450, vol. iii., we are indebted to Lieutenant-Colonel Edwin Fairland. It deals mainly with evidence regarding medical equipment.

Surgeon-General J. Jameson, C.B., continued :—

(Q. 11,778.) But before they were given relative rank they were in a very awkward position towards the soldiers, were they not? What was called relative rank we always had.

(Q. 11,779.) But not to the same extent, or in the same respect, as within the last, let us say, fifteen or twenty years. Before that it was not so? No, it was not. There was a warrant in 1858, which was called our Magna Charta, that Mr. Sidney Herbert, the War Minister, introduced, which gave relative rank, and it was supposed to be equal to any other rank; but it was gradually whittled away, and we were not in the same position as any other officer; that is to say, we were always junior to them; we never could take our place in a mixed board, for example, according to our rank, but must always be junior.

(Q. 11,783.) It has been suggested that the medical military officers should have an opportunity of courses in civil hospitals, and of getting off the rust that to some extent there must be, owing to their not having practice in such diseases as are to be found more generally in civil life than in military hospitals; would you approve of that being done? I think it is most desirable. . . . I think every time they come from a tour of service abroad they ought, as a matter of course, to be sent to a civil hospital and given leave—taking, of course, due precautions that they avail themselves of their opportunities, but given the opportunity of acquiring modern knowledge, because if a man is away for five years, when he comes home a great many things must necessarily have taken place in that period.

(Q. 11,791.) Having leave in that way would necessitate, of course, a larger staff? Or the employment of civil surgeons in their places. While they were there the work would have to be done and paid for in some way.

(Q. 11,795.) As regards the reserve of officers that you had, do you think that they were equally capable with those on active service? You

have to consider the fact that a great many of our reserve of officers are men whose health has broken down, or perhaps they may have been in trouble, so that I should say that comparing man with man the reserve officer is not anything like so good as the full-pay officer. . . . They are out of touch not only with the Army, but in a great many cases with their profession. There were some remarkably good, of course. I took great care to get back the men who would do good work. The hospital that was perhaps the most difficult to manage was the Cambridge Hospital at Aldershot. I knew a man who had worked it most successfully many years before. He remained there during the war, and did most excellent work.

(Q. 11,804.) We have had evidence here that the medicines sent out—a certain proportion of them—were very old-fashioned? I do not think it could have been so. As compared with the small quantity that existed and the amount of medicine sent out, it could only have been a fraction.

(Q. 11,805.) And with regard to instruments, the same has been said, that they were by no means up to the standard of to-day? I can only say that Mr. Makins expressed quite a different opinion, and I take him to be as high an authority as any person who gave evidence.

(Q. 11,806.) It was said that they were by no means equal to those that were brought out by civil surgeons who had served in South Africa? No doubt in some of these civil hospitals they were very elaborate, and so very much so that their equipment was practically useless; and they would be useless in most wars—they were not mobile, and they weighed an enormous amount. I have a table here showing the difference in the weights of our hospitals and theirs, owing to their equipment being so elaborate.

(Q. 11,812.) And as to disinfectants, it was said that in one hospital all that was there was contained in an enamelled basin as you entered the passage? "Disinfectants" are not under medical charge at all, you know; it is under the barrack charge, they have to provide disinfectants. We only use the carbolic acid and those things for professional work, but for all sanitary purposes it is a barrack supply, and if there is any deficiency it ought to be considered due to them.

End of Surgeon-General Jameson's evidence.

Mr. (now Sir) A. D. Fripp, C.B., C.V.O., M.S., M.B., F.R.C.S., called and examined.

(Q. 11,813.) You were one of those who, with Sir F. Treves and others, volunteered for South Africa? Yes. I went out on February 10th, 1900. We took out the Imperial Yeomanry Base Hospital with 520 beds, eventually enlarged to 1,000 beds. My principal work was done there, but I also visited nearly all the hospitals in Cape Colony, in the Orange River Colony as far as Kroonstad, and most of them in Natal as far as Ladysmith.

(Q. 11,819.) And what was the general impression left upon your mind by the Base Hospital? That is a very large order.

(Q. 11,820.) How would you compare the Yeomanry Hospital with one of the regular hospitals? We had the great advantage of being always able to buy anything on making reasonable representation to the Committee at home; and that is one of the great difficulties that the R.A.M.C. officers labour under—there is no way of doing away with the difficulty of having to get requisitions signed by a superior officer, and so on, before he can get an expensive demand carried out. We were in the happy position that we merely had to send a telegram home, saying: "Please authorise expenditure of such or such a sum," and there would come a telegram the same day or the next, saying: "Do as you think necessary"; whereas the R.A.M.C. officers would never have any such chance, so that it is difficult and unfair to compare their hospitals with our voluntary ones; but I think that the base hospitals were as good as, under the circumstances, they could have been expected to be.

(Q. 11,821.) That is what I wanted to put to you. Subject to that condition, you think that the regular hospitals were well managed? Yes, or would have been, if there had only been a stronger brain-piece at the head of the medical department; but when you have a brain-piece that hesitates to check small abuses, which evidently may grow, such as difficulties with ladies, and so on, of which you have heard, or who does not see how such interferences tend to mix up all sorts of petticoat questions and ruffle the backs of the nurses, who should be left quiet to do their proper work unmolested, then, of course, difficulties must arise.

(Q. 11,822.) Upon whom did the responsibility really rest for that state of things; that is to say, for not coping with those difficulties? One of the things that I should like to be allowed to speak openly about here is the fact that all the senior officers, from the P.M.O.—who was the most delightful, charming gentleman (Sir Wm. Wilson)—downwards, through all the senior officers, are impressed with a sort of feeling, first of all, that their service is looked at askance, that their branch is secondary; and next, that they must not approach any general commanding officer, and certainly not if he has got a title, without their knees chattering together with alarm and fright; they must not think of advising him that it really would be for the good of the Army if a camp was not pitched on a certain proposed site because it is covered by stinking horses in various degrees of decomposition. My impression is that Lord Roberts would have been only too delighted if somebody had warned him by saying to him: "I am sure such and such a site is already fouled by the enemy's camps; don't you think, my Lord, it would be better to put your camp a little further out?" But there is a general shirking of taking any responsibility of that kind, taking any initiative, and daring to do anything that is not already laid down in the Regulations; and I daresay that that general fear has a good deal

of foundation in what has happened to individuals who have dared to exceed regulations in the past.

(Q. 11,823.) Then if the R.A.M.C. officers were rather more of doctors and rather less of soldiers, you think they might show a little more courage in dealing with the commanding officers of the Army? That is the direction in which we are working now, and a great many reforms have been already brought about in the R.A.M.C. since the war.

(Q. 11,824.) When you say "we," is that Mr. Brodrick's Committee? Mr. Brodrick summoned a Committee and presided over it himself, and the first clause of their report was to the effect that a permanent Board, constituted partly of junior R.A.M.C. officers and partly of civilian surgeons and physicians, should be constituted to act as an Advisory Board to the Director-General of the A.M.S., who should himself be its chairman; so that he now has the chance of sharing responsibility with several civilian members. I am a member of the Board.

(Q. 11,826.) When you say you are working in that direction, what do you mean exactly? We have already actually accomplished many reforms in the R.A.M.C., and I will put them somewhat in the order of their importance, as tending in the direction you speak of, namely, as making the officers more of doctors. We have facilitated the entrance of a good class of young men from the best medical schools; we have tempted them in. Hitherto the R.A.M.C. has penalised them; it has said to a man: "No, you are so good that Guy's is going to give you a house-surgeoncy, and the result of your thus spending a year over improving yourself will be that if you come into the R.A.M.C. you will find yourself a year junior to the man that you beat for that appointment, and when you have both arrived at fifty-nine or sixty years that man will become Director-General over your head"—which is ludicrous. Now we take them both in together, the man who is good enough to get a house-surgeoncy and the man who is not good enough, and if a man likes to take the post of house-surgeon after he has got into the R.A.M.C., we second him for that purpose. I speak now with an experience of teaching at Guy's for twelve years; that is why I quote it as an example, and also because Guy's is, of course, one of the best medical schools (Guy's and Bartholomew's are possibly the two best in the Empire), and not one single man during that twelve years has gone into the R.A.M.C. who was above the average, until under this new regulation one or two have been tempted in, and several more are seriously thinking of it. In the next place, we have made it possible for a young and good man to get up more quickly through the Service, to shorten his period in each rank, so that he can pass over the merely average man who stands senior to him. By that means the good doctor will come to the front.

(Q. 11,827.) Do you think that officer's rank is essential? I always hoped it was not, but I am under the impression now, after visiting

a number of military hospitals in South Africa and in England also, that we should not be able to get on without the doctors having definite rank and the badges of rank. I do not think that the R.A.M.C. wish it so much themselves, as that it is essential for ordering the N.C.O.'s and men about, and getting proper deference from them. Those are two important reforms which we have accomplished: first, that we have got the good man in; and secondly, that we have provided for his being able to come to the front more quickly. Amongst other reforms that we have brought about, there is what I mentioned just now, that the R.A.M.C. is coming into touch with the civilian profession through this Advisory Board, and through examinerships and tutorships in connection with the Medical Staff College, and so on. Another great point which has tended to make a man a doctor first and an officer later is, that we only examine him now in strictly medical subjects, so that a good young doctor comes out top, whereas a little time ago a man might beat him by being better at French and German, and other subjects of minor importance. That is all knocked out now. Then, again, greatly improved status has been given to the Director-General. He is now a member of the Secretary of State's War Office Council, which sits every week, and so he has direct access to the Secretary of State, which before he had not; he could only get to the Secretary of State through the Commander-in-Chief. And, similarly, his position on the Head-quarter Staff has been recognised. It is not, of course, for the flattering of the individual that that is important; but it is because every member of the Corps, even down to the latest joined orderly, is proud to be able to nudge his girl in the street and say: "There goes our Chief in the King's procession"—that does make a difference.

(Q. 11,828.) And also it enables him, I take it, to lay any point that he wishes before the Secretary of State? That was the first point and the most important; he has direct access to the Secretary of State. In that way, I think, the young doctor is coming to the fore for his doctoring qualities, rather than for his qualities as an officer. And, similarly, the Advisory Board has been given the right to examine all an officer's qualifications for promotion, and, of course, the Board takes very largely into its consideration his professional rather than his soldierly qualifications. So that in future the medical officer will become more of the doctor and less of the officer. I am afraid he must remain an officer.

(Q. 11,830.) What change has been made in the regulations? He has to come back to London periodically for a post-graduate course of instruction and attendance upon the practice of recognised civilian specialists in the schools and hospitals of London. We have instituted an examination for the step from Captain to Major, and he has to come back and do six months' practice, either in a civilian hospital or in one of the large teaching military hospitals which are being created, before going up for that examination, and that brings him into touch with modern methods.

(Q. 11,831.) Did you find these officers in South Africa to be lacking in a knowledge of modern methods? They have been away such a long time you see. I do not think they are more lacking than you would expect, but they undoubtedly are lacking. I think it is most essential to get them home to rub shoulders with the young men in the civilian schools, who really know the modern methods. You see, our science is so essentially a progressive science that a man of 60, or 50, or even 40, and it is no exaggeration to say, even a man of 30, who has been away for five years, when he comes back finds a whole lot of new developments, and he is not an up-to-date man until he has acquired them: and until the R.A.M.C. was brought into touch with the civilian profession, as it is now, there was no chance for these R.A.M.C. officers to bring themselves up to date. . . . I have no hesitation in saying, that if he has shown keenness, by making opportunities for himself, he has got himself disliked thereby. You see that in many a confidential report.

(Q. 11,835.) Disliked by whom? By his seniors, by the Colonel in command. As soon as a man becomes Colonel in command he ceases to be a doctor at all, he becomes a purely administrative officer.

(Q. 11,836.) Surely, is not that an objection to the rank? I see exactly the force of what you say, as to the advantages of rank in dealing with N.C.O.'s and men, but is not that a drawback which you have just put your finger upon?

I think it is the greatest possible drawback. You see, Sir Frederick Treves, for instance, supposing he was in the R.A.M.C., or any other eminent surgeon, unless he happened to be appointed Professor of Military Surgery at the Medical Staff College, would not be able to take any post except an administrative post. This would be that of P.M.O. of a large hospital, and then he would have two Lieutenant-Colonels under him, one the chief surgeon, and the other the chief physician, but the great surgeon himself would be so inundated with administrative work that he would not be able to find time for the actual practice of surgery.

(Q. 11,838.) Have your Board attempted to grapple with that subject? We have attempted to do so, but I am afraid the attempt has failed, because you must have some alternative. Who is to have command of these general hospitals? Personally I should be quite content to have simply an Army Service Corps officer.

(Q. 11,839.) To do the administrative work? Yes.

(Q. 11,840.) But why should the gentleman who has to do the administrative work dislike a keen young officer who endeavours to inform himself outside the R.A.M.C.? I hope they will not, and I do not think they will much longer, but there is no doubt that at the present time there has drifted up into the senior ranks of the R.A.M.C. a body of men who should not be taken as representative of the better class of

our profession. For many years the R.A.M.C. has only tempted in the weakest of our profession; some others have gone in, but I think the Corps has opened its doors specially to the weakest.

(Q. 11,841.) Is not what you are alluding to there not an uncommon failing of men after they reach a certain time of life—to object to all, what they consider, new-fangled notions? Yes, I daresay that is one of the springs of action; but there is also the fact that these comparatively weak men have drifted up to being in command, and really now they are suffering from “swelled head,” and have gone about much more bent on exacting salutes from everybody under them, and similar trifling matters of that kind, rather than with any kind of keenness whatever as to scientific attainments.

(Q. 11,842.) Possibly they had never been keen as young men themselves in the Service? Possibly not. One very eminent gentleman said; “Oh, the R.A.M.C.! Yes, I will undertake to make an excellent corps of it if you will let me tear out the first two pages from the ‘Army List.’” That was unnecessarily drastic—there are several excellent men I know in the first two pages of the “Army List”; but it remains true that from the lower ranks very many “weak men,” who should never have been admitted at all, and certainly would not be under the new Regulations, have drifted up to the higher administrative ranks of the Corps.

(Q. 11,843.) To go back to that point of rank, which seems to me worth consideration, if Sir Frederick Treves happened to be in the R.A.M.C., you think he would not be able to establish his position satisfactorily unless he was called a General? He would never have had the opportunities of becoming what Sir Frederick Treves is now—that is the difficulty; he would have been told off for some possibly uncongenial duty by some superior officer, and he must do implicitly what his superior officer tells him. I can give you an instance. My present house-surgeon at Guy's was out in the war in South Africa, and he was told that he was to attend to some typhoid patients in a tent, so, of course, he did attend to them. Three of them were very bad indeed, and he was told to sleep in the tent. He said to his superior officer, “I suppose I need not sleep actually in the tent, need I? I may sleep with my head outside the tent, or I may sleep just outside with a string attached to my toe, so that if either of the patients wants me he can pull it, and it will wake me up?” And it eventually ended in his being told that if he did not sleep actually in the tent he would be liable to be shot, which is ludicrous. The sequel is that the poor boy went down with enteric at exactly the right incubation time afterwards. There is too much of that kind of thing about it. There was an instance of a boy wanting to make a very good endeavour indeed, and being rather crushed in the bud, and getting out of the thing as soon as possible. Of course, a man of attainments and character would most certainly resign as soon as he got the chance after such treatment.

(Q. 11,844.) All that seems to point rather to making the R.A.M.C. more civilian than military; that an Army doctor should be more of a doctor and rather less of a soldier? But I am afraid you must keep him a soldier. . . . There is another point I should like to mention. I think the running of the base hospital would be improved enormously if we could divide even large hospitals into serious and slight departments. People who have not studied a large military hospital do not appreciate this. A civilian hospital consists of its beds, its out-patient department, and its convalescent home, to which are sent patients as soon as they are convalescent. A military hospital has to keep all those three classes in until they are fit to go back actually to the front, and live on biscuit and bully-beef; so that two-thirds or three-fourths, and even in some cases nine-tenths, at least, of the cases are not such as would get admittance to a civil hospital; they are not sufficiently serious cases. A soldier goes sick from a variety of trivial as well as serious causes; for instance, the loss of an excessive number of teeth, or from a bad cut on his finger—anything that makes him short of a perfect fighting unit—and there is only one place where he can go to when sick, and that is the military hospital. The moment he is in he is treated just as if he were seriously ill, *i.e.*, he monopolises the time and attention of people whose energies should be spent upon those who are seriously ill, and he occupies an expensively equipped bed. Every hospital should be divided into a hospital proper and a convalescent camp; that is what we did at Deelfontein . . . The plan was copied extensively in South Africa. Enormous convalescent camps were established; these men were quite capable of cooking their own food and making their own beds. There was no need for them to be attended to by the nursing sisters; on the contrary, they were so well that they were difficult to handle.

(Q. 11,855.) Who devised that system? It was my own idea. It was not copied from any other scheme. I simply sat down and thought out the hospital according to my own ideas of what a military hospital should be like.

(Q. 11,856.) Was that as soon as you got out to South Africa? No; it was all evolved over here before we started. It was most amusing. I was told that it would be a complete wreck. I was solemnly advised by one gentleman on the Headquarter Staff of the Director-General. His last piece of advice to me was: "You are making an awful mistake about these nurses; they will all be tripping over each other's skirts. There will be nothing for them to do. Take my advice and lose them."

(Q. 11,857.) Was this a gentleman who had had some experience in a previous war? Yes, but not in a war with whites. It was a very good thing for the R.A.M.C. that the Boer War came, because they were basing all their ideas on wars with blacks, in which, of course, nurses cannot go anywhere near the fighting . . . but in this South African War we knew that no harm would come to our women nurses if captured

by the enemy; and that should have made all the difference in our hospital arrangements.

(Q. 11,858.) You mean that the R.A.M.C. here and the Director-General never realised that as fully as you did? Not for a single moment, I am quite sure. There was a complete want of realisation out there, and at home, as to how much use nursing sisters could be; also as to how big the need for accommodation and open-minded administration had become.

(Q. 11,860.) What do you say of the equipment of the army surgeon out there, their instruments and other appliances that they had: what were they like as compared with yours? Generally speaking, I should say they were quite adequate.

(Q. 11,861.) We have heard that to a very great extent they were old-fashioned? They were at first, because we had an old-fashioned Headquarter Staff of the R.A.M.C.

(Q. 11,863.) We have had evidence which went rather to show that the equipment was old-fashioned; that the instruments, first of all, had wooden handles, and that it was difficult to sterilise them? A wooden handle does not matter; you can sterilise it perfectly well. Surgery is a very secondary matter in the part that our medical profession ought to play in war nowadays. The surgery proper is done at the base hospitals, but very little even there. We touch there on the all-important point with regard to the position of the R.A.M.C. and of medicine in any future war. It is that our profession can be of enormous help to the combatant ranks if only they will realise how much we can do now to prevent disease; therein lies the hope of being able to help our country to win its next war.

(Q. 11,864.) Sanitation? Sanitation and hygiene, of which they do not understand the merest elements. Tommy does not understand it because his officer regards it as just a fad. If only the combatant officer can be interested in the elements of hygiene and sanitation, then he will see that his men obey the elementary laws of personal health, as to boiling the water, and so on, when it can be done. What we cannot get the authorities to see is the *strategic importance* of it, which comes out very prominently if the figures are examined. How much sooner Lord Roberts's hands would have been free to move from Bloemfontein, and dash after the Boers to Johannesburg, if it had not been for that heavy epidemic. It would have saved the nation a considerable number of men and a correspondingly large amount of money.

(Q. 11,865.) What was there to prevent the Director-General, R.A.M.C., from dealing with that problem years ago? It is not a fresh idea to you? The quaking of the knees, I think. There is not the faintest doubt that that was a disease from which the responsible medical officers all suffered; they were all afraid to go to their commanding officer and ask for an interview and make suggestions. I mean that they were afraid to go to

the head people, they would only dare to go up through the channels which the Regulations gave them the right to apply through.

(Q. 11,866.) You and most of the eminent surgeons received every encouragement from the Army authorities when you volunteered to go out, in the first instance, did you not? Yes, every encouragement.

(Q. 11,869.) Were they (physicians) encouraged to go? Certainly not in the early days. I was looked upon as a crank for taking a physician out with me. One comment that I remember was: "Take as many surgeons as you like, but, my dear fellow, the one thing that our officers do understand is the treatment of enteric." Well, they do not, at least, they did not. They do know that they have had an enormous experience, but they did not understand how even to write its name down in the slightest cases, because they called it "simple continued fever," unless it had very marked symptoms; and they allowed that man with simple continued fever to go about and infect other people, and the other people so infected may have the acutest enteric.

(Q. 11,870.) And that was during the earliest stages of the war? Yes, they threw cold water on physicians, but they allowed me to take one. Dr. Washbourne came with me, and was of the greatest use. Another thing they did not understand among modern methods was the enormous practical advantage of having steam disinfectors at each large hospital. I took one out, and was roared at for taking it, but very soon they sent them out to as many of the hospitals as they could get them to. Similarly, all the excreta from typhoid patients ought to be destroyed in some way. At first they did not make any systematic efforts to destroy them, and that is the chief reason why the disease spread so rapidly and so widely.

(Q. 11,879.) You look to this Advisory Board really to cope with all the defects of the R.A.M.C.? I believe that if it is only loyally supported, as it is by the present Secretary of State for War and the Permanent Under-Secretary, and if that loyal support continues, the difficult task of popularising among the good men of our profession and rendering really efficient the R.A.M.C. is practically accomplished.

(Q. 11,882.) We have been told that in the Russian military hospitals the civilian sick are admitted, in order that the Russian medical officers may have a greater field of experience. Would you approve of that course being adopted in our large military hospitals here? At the present time they will not come; the difficulty is to get even the wives and children of N.C.O.'s and men to come in. The military hospitals are too much like barracks or workhouses. We civilian members of the Advisory Board have been visiting them lately, and it will take time to live down the feeling that there is among the non-commissioned ranks, as well as the commissioned ranks, against the R.A.M.C. It will take a long time before they will realise that the R.A.M.C. is efficient, and it will take some years, I think, before it really is so.

(Q. 11,883.) I do not know whether you have seen the report on this subject of the Royal Commission on the Care and Treatment of the Sick and Wounded during the South African Campaign? Yes, I have.

(Q. 11,884.) You may have noticed that in that report the Committee speak of the prejudice or the distrust which the private soldier has of the military hospitals and of the reluctance to go there when sick. That is your experience also? Yes, to go there for anything serious. They come trooping to the civilian hospitals, Guy's, for instance, for any operation to be done, and it is a very good thing for them that they do at present; but we hope to make it different in the future.

(Q. 11,885.) It is also stated that amongst military officers there is a feeling of distrust of the skill and professional experience of doctors of the R.A.M.C. You think that is so? Undoubtedly.

(Q. 11,886.) That, you think, ought to be done away with, if possible? We must try and live it down, and in time we shall succeed.

(Q. 11,887.) Do you not think that some arrangement might be made which would make these military hospitals less of a barrack and more of a hospital, and allow the civilian sick in, in order to educate the Medical Corps? It would be excellent, but of course it means expense, and the Treasury is a very difficult body to get over.

(Q. 11,888.) After all, would it not be the truest economy to have the R.A.M.C. thoroughly efficient men? It would, because of the expense already alluded to of training Tommy and putting him at the front.

(Q. 11,889.) And every man whose life is saved is a distinct gain to the country? Yes. During the last month I have visited the military hospitals at Aldershot, Netley, York, Portsmouth and Gosport, and in every case I found that considerable expense must be incurred before the hospital can be brought up to date as such. Several of them have not got an operating theatre at all, and not one has got a proper upward flushing jet of water to wash out a bed-pan, for instance. The putting in of these fittings would cost a good deal of money, and if the Commission can strengthen the hands of the Advisory Board in its endeavour to get control of a few thousand pounds, we are only too willing to go round the country and see that that money is spent on one or two military hospitals each year, and so gradually we shall get them all up to the standard of the twentieth century. We want the Government to give us £20,000 a year for the next few years, to bring our military hospitals up to a state which will make them fit to be called hospitals. One, for instance, at Aldershot has a high road running through the middle of it! The operating theatre is on one side of the road, and the instruments have to be kept, by regulation, on the other side. The one side is called Hut Side, because it consists of old disused Crimean huts; and the other side is called Union Side, because it was in its palmy days

a union or workhouse, until it got too dilapidated for that, when it was turned over to be a military hospital. That is not good for the officer in command of it; it damps his ardour, and is certainly not good for the N.C.O.'s and men, who are brought up to think that anything is good enough for a military hospital.

(Q. 11,899.) Do you not think that the distrust which you speak of applies more to the man himself than to the profession? Yes, of course, the personal equation will always come in. A really capable man will soon engender trust among people who come in contact with him.

(Q. 11,900.) An officer of the R.A.M.C., if he is a good man, will shove his way even in a civil station, will he not? He is not allowed to take private practice.

(Q. 11,902.) Surely? I have employed them myself, particularly one man, whom I have in my mind now, who was a Captain in the A.M.S., who came to the station where I was. That was in India? I do not know anything about India. I daresay they are allowed to take private practice over there.

(Q. 11,904.) All I can say with regard to the R.A.M.C. is that that man got about the best practice in a large station.

(Q. 11,905.) I suppose there are many men in the R.A.M.C. who keep up their reading? Yes, certainly. Any depreciatory remarks that I have made were not intended to apply universally.

(Q. 11,906.) I know myself that there were two men, the one I have spoken of and another, who kept up their reading all their lives? Yes, and I know one officer of the Corps who has recently got a Fellowship of the Royal Society for original research.

(Q. 11,907.) A certain percentage love their profession? Undoubtedly a very large percentage love it.

(Q. 11,908.) On the other hand, I daresay there are a good many who do not keep up their reading? Yes, a large number, who have been attracted by the fact that, once in the Corps, there they can stop and draw steadily increasing pay, and after twenty years' service get a pension, and they know they will not be kicked out for anything less than gross misbehaviour.

(Q. 11,913.) But you say that he (the private soldier) prefers the civil hospital to the Army hospital? If he has to have any serious operation done. He does not mind being in the military hospital, but if at the military hospital he is told "you must get that cured by an operation," then he prefers to come to a civil hospital to have it done. To take rupture, which is a very common case. If a man has a rupture, they will not let him go into the Army; but if whilst he is in the Army he acquires a rupture for the first time, and he is told, "You will be retired unless you get this cured," then he prefers, as a rule, to go off to a civilian hospital to get it operated upon.

(Q. 11,914.) May his going to a civilian hospital be accounted for by

the fact that he knows that there he will probably have a specialist to operate upon him? Yes, I think so; but specialists can be grown in the R.A.M.C. There are just the same elements for growing specialists there. All that is required is practice and suitability and keenness.

(Q. 11,916.) Will he have an opportunity of seeing as much practice, as many operations, as he would at Guy's, for instance? Perhaps hardly as much as that, because we have a larger body of patients; we have a larger body of acutely ill patients. If only you can rid the military hospitals of the enormous number of convalescents, who should be sent to big convalescent camps, where they will not be such a heavy expense to the State, then the military hospitals will be put to their proper functions.

(Q. 11,918.) Then you say that in a military hospital these convalescents really take up as much of the medical time as the serious cases do? Yes, because there are elaborate papers to be signed every day for every article of diet, which are written out by the medical officer, and this takes up his time and energies.

(Q. 11,919.) You mention in your *précis* that a dental surgeon would be valuable for a field force. I do not think you have given us any evidence with regard to that? No, but I took one myself to South Africa upon the staff of the Imperial Yeomanry Hospital, and I was also rash enough to take a masseur, and they said I was completely mad for taking both those persons—it was my last proof of madness. But I have no hesitation in saying that that masseur was of more help to Lord Roberts's army than any individual medical man, physician, or surgeon in South Africa. He paid as many as fifty-one visits a day, and was in enormous request, and he did a great deal in shortening the time and in getting men back to the front quickly. The way in which he curtailed the stay of patients in hospital I verily believe helped the State more than did the work of any individual surgeon in South Africa. There, again, we were promptly copied, and masseurs were appointed to many different hospitals, or berths were found for them in some unofficial way.

(Q. 11,928.) Yours is an Advisory Board? Yes.

(Q. 11,929.) And the instructions, then, are given through the Secretary of State, on the result of your deliberations, to the Director-General? Yes.

(Q. 11,933.) It was customary, and is perhaps now the case, that medical officers, on entering the Army, should go to Netley to have a special course of training in bacteriology and hygiene? Now we have brought the Netley School up to London. It is now called the Medical Staff College in London. It has not yet got a permanent building, but it has a temporary accommodation, and that is a great advantage. Thus the Lieutenants on probation, the professors in the school, and the senior officers taking out their post-graduate courses of instruction before going up for their examination for promotion, are now rubbing shoulders with the civilian schools in London.

(Q. 11,935.) You consider that under the present system, as recommended by your Advisory Board, you will be able to induce a superior class of young men to enter as officers of the Army? Yes. The proof of the pudding is in the eating, is it not? I think you would have to go back ten years before you would find as many applications as there were vacancies announced for the R.A.M.C.; and moreover, they were formerly always afraid to announce the actual number of vacancies that existed: they would only announce ten, and then they would only get four or five applicants. The first examination under the new regulations was held last July, and for thirty advertised vacancies we had seventy-six applicants, a sufficiently gratifying contrast to the former state of things.

(Q. 11,937.) We have been told, I think, that they were (on the old system) perhaps superior to the average. You do not think so? Oh dear, no. There would be a few quite good ones, certainly, but the majority of them were shocking. They were so shocking that we have made it one of our regulations that the candidates have to appear personally before the Advisory Board, and out of those seventy-six we stopped nine from going on for the examination at all, merely on account of their appearance and behaviour and their general illiterateness; it appeared impossible ever to make them into fit officers to bear the King's Commission and to do credit to the Corps. That is what we are so very anxious about—to live down the feeling which undoubtedly exists amongst the combatant branches that the Army doctor is not a gentleman.

(Q. 11,945.) There is only one question I want to ask you. Have you ever contemplated what you would do at your Advisory Board if by any chance you had an unsympathetic Secretary of State? No, indeed, I have not. We have been so fully occupied working out in detail as much as possible of the scheme of reform embodied by Mr. Brodrick's Committee, while we had a Secretary of State upon whose support and sympathy we could rely. But it is a truly terrible contemplation.

(Q. 11,946.) You have no means of utterance, have you, beyond the walls of the room in which you meet? No, but, I rather imagine that if the civilian members were all to resign, that would have some effect. . . . The permanent Under-Secretary of State sees our advice first of all, then the Commander-in-Chief, and then the Secretary of State; each of these minute it and return it to the Board, and so far they have always accepted our recommendation.

(Q. 11,956.) I suppose that book of Lady Howe's on the Yeomanry hospitals really contains all the information on the subject; I suppose it is the great authority upon the management of hospitals in the field? I do not think that its contents should be so regarded or trusted. I have refused to have anything at all to do with the production of the book. I know that it contains many misleading statements. I regard it as a perpetuation in print of a great deal of the spirit that should never have been evoked at all in the last war, and that one would have imagined

would at least have been excluded from having any weight in the management of a large hospital, financed by public voluntary subscriptions. I know for a certainty that a whole lot of the statistics are not right, they are simply what would be called, if it was a money matter and it was done in the City, "cooked," so as to make an impressive number of figures, and I know that a whole lot of statements as to services rendered, and that kind of thing, are simply and absolutely untrue. I was asked to verify the statements and said I would not. I went out as chief civilian medical officer and senior surgeon of this big hospital. I was responsible for its being increased from 100 to 520 beds, and I had the choosing of the medical staff, including the R.A.M.C. commandant and the nurses. I had the responsibility of choosing, or of ratifying, the choice of all the equipment, which involved an expenditure of nearly £100,000. Further, I had to plan the establishment and the working of the institution, and I was responsible for all the features in which it differed from the military hospitals, and broke new ground, and after eight months of such work I did not feel inclined to simply write my article in this book without seeing what other people who went as my juniors chose to say.¹

(Q. 11,965.) I gather from your evidence that one great medical lesson to be learnt from the war is the necessity for good sanitation? Yes, I think so, undoubtedly.



¹ Since this evidence was given, Sir A. Fripp, as a result of some correspondence with Countess Howe, has found it necessary to say "that on reflection I think my conclusions were hastily come to, and that even if they had been expressed in less sweeping language they are liable to a construction which goes beyond what was justifiable." He expresses his regret "for what has been construed as allegations against the good faith of some of those with whom I was associated."—E. F.

Reviews.

"SYPHILIS AND GONORRHOEA." By C. F. Marshall, M.D., F.R.C.S., Senior Assistant Surgeon to the Hospital for Diseases of the Skin, Blackfriars Road, London; formerly Resident Medical Officer to the London Hospital. Published by Rebman Ltd., London. Price 8s. net.

This is a very interesting little work, but requires further editing to make it of practical use.

The pathology and manifestations of syphilis have been sufficiently described for all practical purposes. As regards treatment, we think the author would do well in future editions to enter into somewhat fuller details. For instance, we fail to find any caution as to examining the patient's urine for albumen before beginning or during a mercurial course. No advice is given as to watching the effect of the drug on the patient, or as to when the dose should be reduced.

The dose of grey oil (p. 175) is not mentioned. The author fails to state how many injections should be given in each course, unless he means the weekly injection to be continued for six months, as stated generally on p. 172, under duration of mercurial treatment.

As to the treatment of gonorrhœa (p. 204) by the injection of the newer silver salts, the strength of the solution to be used is only mentioned in the case of protargol; this is given as 1 per cent., which is somewhat stronger than most patients would care to begin with. It is also not very clear at what stage of the disease the author advises the use of injections (p. 210). In mentioning Guyon's instillations of nitrate of silver the author gives the strength of the solution as from 5 to 20 grains to the ounce. It would be advisable to make this somewhat clearer, as even the weaker strength, if used at first, would probably cause somewhat sharp reaction.

In its present form this manual can hardly be recommended to our officers. The sections on treatment are weak, and there is really little of practical value to an Army medical officer.

C. E. POLLOCK.

"WITH RUNDLE'S EIGHTH DIVISION IN SOUTH AFRICA." By J. C. Wetton. London: H. J. Drane.

The writer of this book was a Volunteer in the R.A.M.C., belonging to the 23rd Field Hospital, during the South African War. Having kept a journal he, from time to time, contributed portions of it to some of the Sussex newspapers, and at the end of the war was asked to rewrite these contributions and bring them out in book form. The result is a handy volume, containing a detailed account of the writer's experiences from March, 1900, to March, 1902, which has some value, as being a transparently truthful description of a private soldier's doings and sufferings during those two long and weary years of field service. It cannot be said that the reader will gain any "large view" of the military events that took

place; but he will find in these pages an accurate description of the daily drudgery, the hardships, the scant rations, the constant trekking backwards and forwards, which cannot fail to win admiration for the pluck and endurance of our men. The author has not enlarged on medical questions: he was struck by the fact that "in the foot regiments the shorter men seemed to stand the hardships and privations of the campaign generally better than the taller ones. The 'big' Guards, although great in physique, didn't seem to possess the same degree of stamina as the little Infantryman, who was full of witticisms at the expense of his larger comrade" (p. 244). He also noticed that "when resting in camp or town more men seemed to sicken, as though a reaction had set in from the effects of the hard trekking and privations" (p. 251). He bears testimony to the care taken in the management of the Boer refugee camps (p. 444). He gives a graphic description (pp. 462-470) of the disaster at Tweefontein on Christmas morning, 1901—a second Majuba—the story of which should indeed be read, and re-read, "lest we forget"—again. The helplessness of our troops, as compared with foreign armies, in regard to individual cooking and preparation of food on service, has often been commented on; the author gives a dismal account of the lot of the man, provided with a ration of flour and trek ox, but with little or no fuel, save a little cow-dung. There must have been considerable suffering and loss of efficiency from malnutrition and dyspepsia, much of which might probably have been prevented if the men had been trained in the elements of field cookery, or making the most of a very little. The author gives a circumstantial account (p. 495) of the scorpion stinging itself to death when surrounded by a circle of fire; this "traveller's tale" dies hard. The book is illustrated by some photographs, but the typography leaves something to be desired. Mr. Wetton is to be heartily congratulated on having made a small, but distinct, contribution to the real history of the South African War of 1900-1902.

A. M. DAVIES.



Current Literature.

"Wheeled Knapsacks."—In the *Giornale Medico del Regio Esercito* for July 31st, Surgeon-Lieutenant R. Castellani, of the Italian Army, gives an excellent paper on the result of his studies on diminishing the weight carried by Infantry soldiers. As its length precludes a literal translation for the ROYAL ARMY MEDICAL CORPS JOURNAL, a short summary merely is here given, with special reference only to the wheeled method for the carriage of knapsacks. After describing the various burdens actually carried by the various classes of foot soldiers, and the theoretical limits of weight to be carried by each individual, also the various suggestions for diminishing this weight, whether by reducing the size, weight and number of the articles of clothing and equipment carried by the soldier as well as by an equal and rational distribution of the same over his person, the author discusses the advantages and disadvantages of the *roule-sac* of Surgeon-Major G. Saint-Paul of the French Army (which were published by him in the October number for 1902 of the *Touraine Médicale*).

These *roule-sacs* carried from four to twelve knapsacks and were capable of being taken to pieces, each of the several component parts being distributed for carriage amongst a squad. The chief objections noted by Dr. Castellani to this method were briefly: (1) That the component parts were not of the same weight (varying from 3 to 5 lbs.), which alone might be a cause of friction amongst the men; (2) any one portion of this little cart being lost or damaged would render all the other parts useless, and would deprive several soldiers from benefiting by the relief of temporarily unburdening themselves of their knapsacks; (3) the difficulty of replacing those parts which were damaged or lost; (4) in the event of illness, &c., someone of the section would have to carry an extra portion of the framework; (5) the initial cost of the machine, which, being made of bicycle material, must be relatively high.

Dr. Castellani, therefore, devised an arrangement which was to fulfil the following conditions: a wheeled apparatus, complete in itself, suitable for a single individual, simple in construction, inexpensive, readily attachable to each knapsack, and as readily taken to pieces when the knapsack has to be carried on the back.

The three models are here shown.

To economise space I have avoided giving a detailed description of them.

Weight.—No. 1 weighs about 2½ lbs. Nos. 2 and 3 each about 3 lbs.

Price.—This is stated to vary between 1s. 3d. and 2s.

Materials.—No. 1 is made mostly of wood, No. 2 of wood and metal, No. 3 is all of metal.

Solidity.—The solidity of these appliances have been proved by ample tests. No. 1 can carry about 60 lbs., No. 2 75 lbs., and No. 3 65 lbs., they last for some considerable time, and they run smoothly and easily.

No. 1, when trailed along (as in fig. 1) gives the greatest velocity on the line of march, but lengthens the column by about one foot per knap-



No. 1.



No. 3.



No. 1.



No. 2.



No. 3.

sack (or 75 metres for a battalion a thousand strong, marching in fours), this, however, is stated to be its only drawback. The two others, being wheeled by the side of each soldier (as in fig. 3) do not offer this objection. No. 1 can also be used in this manner, if so preferred, or it can be pushed along as a hand-trolley, especially when going uphill.

J. E. NICHOLSON.

The Campaign against the Nagana Disease in Togo.—In the *Deutsche Kolonialblatt*, No. 1, 1904, Dr. Schilling gives the results of his investigations, so far as completed, from July to November, 1903. Nineteen bullocks, inoculated against tsetse-fly disease in July, 1902, were kept in Sokodé, in order to discover whether any harm resulted from inoculation with parasites which had passed through a series of dogs. Two oxen died in the following November from causes not ascertained. But if both died from Nagana the fatality was only 10 per cent.—a satisfactory result.

Dogs and guinea-pigs were inoculated with blood taken from the bullocks; in four out of nine of the latter trypanosomes were found in the blood. It follows that the results of infection of oxen, as above described, may remain for a year afterwards. If it be suggested that the parasites were due to infection by tsetse-flies, the mildness of the results must be regarded as due to the protective inoculation. Observation of such animals for at least a year is absolutely necessary.

On August 19th, 1902 (nineteen to thirty-four days after the last injection with parasites from dogs), nine oxen were brought to Atakpame. Of these five died at intervals of from twenty to ninety-one days afterwards; four remained apparently healthy. Hitherto no bullock had survived more than six months. Assuming that all the deaths were due to Nagana, 44 per cent. of the oxen remained healthy.

Eight oxen, similarly inoculated, were sent to Tove. Dogs inoculated with their blood remained healthy. Hence, it appeared that the oxen had recovered from the inoculation and had not been injured by the new infection to which they had been exposed. The subsequent death of the animals was attributable to the fact that they were used for draught purposes, to which they were unaccustomed, and likewise to the bad character of the food and water.

The passage, three times, through dogs suffices to influence horse trypanosomes, so that they become non-virulent for oxen. A cow infected with parasites passed three times through oxen remained healthy; a year afterwards its blood contained no organisms. Those inoculated with parasites less frequently cultivated all died. In a sheep, also brought from the East, I discovered a trypanosome, closely resembling the *T. brucei*, but clearly distinguishable therefrom. The former swims like a minute fish across the field of the microscope, whereas the *T. brucei* wriggles like an eel, and does not rapidly change its place. In stained preparations the posterior extremity of the trypanosome is quite round, and the small chromatin nucleus is at the posterior end of the body. The organism appeared to be identical with that first discovered by Staff-Surgeon Dr. Ziemann, in the Cameroons. During the last part of my stay in Sokodé I believe I found a similar organism, very sparsely distributed, in the blood of a young bullock.

When infected dogs are confined in a large room, infection is spon-

taneously conveyed through open and bleeding wounds, and perhaps through flies which collect around such dogs. Great care is therefore necessary in using dogs for experiments. White rats are useful for this purpose; reaction takes place in a few days; in guinea-pigs, inoculation with very few parasites is rarely successful.

The oxen referred to at the beginning of this abstract left Sokodé early in August and reached the coast after a three weeks' march through the tsetse district during an unfavourable time of year. They remained apparently quite healthy, in spite of the fact that they must have been bitten once or more times by the many tsetse-flies they encountered on the road.

The expectation that horses that have passed through one attack of tsetse disease will remain immune has not been realised. Even a "latent" infection with Nagana may finally cause death, or may not protect from reinfection. Schilling has not been able to confirm Niemann's belief that Texas fever occurs also in Togo.

T. P. SMITH.

The Influence of Fatigue on Accuracy of Shooting.—This subject has recently been investigated by Dr. Benech, Director of the Sanitary Service of the 20th Army Corps (*Le Caducée*, July 2nd, 1904). Experiments were made upon five riflemen, carrying their kit, and having marched for four days at an average speed of one kilometre in twelve minutes, the daily duration of the marches having been three, four, six and seven hours respectively. Every hour the men fired successively ten shots at a target distant 200 mètres. The shooting was closely watched, and its accuracy did not appear to be influenced by the marching. Such a result was unexpected by the professionals. Observations of other kinds were made by surgeons, having reference to (1) differences in the sensitiveness of the retina; (2) persistence of the retinal impressions; (3) the force of the manual pressure and the traction power (raising a weight with both hands), measured by the dynamometer. In all these respects the marching made no difference. The weight of the men was lessened by from 200 to 1,500 grammes. Lastly, the oscillations of the rifle, held in the shooting position for twenty-five seconds, were registered; there was no sensible variation in the daily oscillations.

The results of the experiments must therefore be described as negative. The marching of these trained men, carrying twenty kilogrammes, and performed as described during from one to eight hours, had no effect on the precision of the shooting, the sensitiveness of the retina, or on the power and co-ordination of the muscles specially employed.

T. P. SMITH.

The Value of Sugar during Soldiers' Training.—Under this heading Surgeon-Major Drouineau (*Le Caducée*, August 6th, 1904) gives an account of his experiments in order to test the accuracy of Boigey's inferences, as published in the same journal for January 9th, and summarised in the JOURNAL OF THE ROYAL ARMY MEDICAL CORPS, July, 1904. Boigey gave twenty men forty grammes of sugar daily for a month, and repeated the experiment. Sixteen men gained in weight from 1 to 4 kilogrammes; in the others there was no such change. There was no actual improve-

ment in the general health; on the contrary, in some, there was loss of appetite, irregular action of the bowels and diarrhœa; in others, depression and muscular weakness. Sugar was found in the urine, once as much as 3 grammes in a litre. Such results strongly contradicted Drouineau's previous experiences.

The training season of various regiments enabled him to make further experiments of longer duration. The Director of the sugar factory at Abbeville kindly supplied the necessary sugar. The training commenced on February 1st and 18th, at Soissons and Amiens respectively. There were twenty-five infantrymen and fifteen artillerymen submitted to experiment. Three marches were made weekly; at Amiens two were long and at a moderate pace, the third was much shorter and rapid. The training was progressive; it was not till the beginning of May that the marches were extended to 45 or 50 kilometres. At Soissons the arrangement was somewhat different; in one period the marches were gradually lengthened up to 50 kilometres at a uniform speed of 7 kilometres per hour; in the second series the distance did not exceed 25 kilometres, but the pace was progressively accelerated. Every day, for three months, sugar was taken by the men in the following doses: At Soissons, beginning with 100 grammes the quantity was raised in about seven weeks to 350. At Amiens they began with 150, and in the last fortnight of May the dose was 350 grammes on marching days and 300 when at rest. The men took the sugar just as they pleased.

The writer, who was at Amiens, states that no man showed any signs of illness attributable to the sugar taken. On the contrary, the men were unanimous in testifying as to the good results; the marching caused no fatigue, and the officers were astonished at their health and agility after marching for five or six hours, and covering 50 kilometres of rough ground. Men not being experimented upon would ask for sugar, having witnessed its good effect on their comrades. The men were not weighed, but examination of the urines never disclosed the least trace of sugar.

An officer who took great interest in the experiments was highly satisfied with the result. He stated that when the dose reached 200 grammes, the men had less appetite for bread and legumes, and confined themselves mainly to meat and sugar. There was increase of weight among some, but no decrease was noted. After the discontinuance of the sugar the men asserted that they missed it. The writer is satisfied that the administration of sugar enables men to make great and prolonged efforts without any injury to the general health. Boigey's experiments, it may be noted, were made upon men doing only their usual work, and taking ordinary rations.

T. P. SMITH.

Notes on the Russo-Japanese War.—Under this heading, Naval Staff-Surgeon Matthiolius, writing from Yokohama, gives some account of his experiences (*D. Militärärztliche Zeitschrift*, September, 1904). He states that large numbers of the Russian troops are furnished with rifles of a calibre 7·62 mm., as against 6·5 mm. of the Japanese weapon. The Russian bullet weighs 14 grammes and has an initial velocity of 620 metres; the Japanese figures being 10 grammes and 725 metres respectively. Both weapons have central magazines, each containing five rounds. Each Japanese division comprises about 14,000 men, and has one general

hospital and six field hospitals. Their command of sea-transport enables the Japanese to effect a speedy removal of sick and wounded from the front, and hospitals have been established at many of the coast towns. In Tokio there is a large permanent hospital of the Red Cross Society. Such voluntary aid, with Prince Kanin at its head, plays an important part in alleviating suffering. The Society was founded in 1877, and in 1903 it comprised 894,760 members. The subscription is either one payment of 25 yen, or an annual contribution of 2 or 3 yen. At the end of last year the funds in hand (exclusive of buildings and other immovable property) amounted to 7,371,500 yen; and in the first three months of this year, 238,145 yen were furnished by collections.

A large amount of useful work is done by the Lady Volunteer Nurses' Association. These nurses are described as unpretending, modest, willing and skilful. They attend to the sick, and take charge of the relations of soldiers and sailors. Assistance has been offered and money sent by the German and Italian Red Cross Societies, and from India and China. A number of nurses from America are occupied in a reserve hospital in Hiroshima.

The Empress of Japan, besides much other active charity, has undertaken the supply of artificial limbs, and included Russian prisoners in her list. Wounded prisoners are cared for in other ways; in their places of confinement there are sick wards furnished with all necessary appliances. In the crossing of the Yalu by the first army the Japanese lost in killed, 5 officers and 180 men; wounded, 25 officers and 690 men. The loss in killed was therefore 4·4 per cent.; in wounded, 17. At Kinchou and Naushan, the losses were: killed, 34 officers and 750 men; wounded, 65 officers and 3,355 men; the total losses amounted to 10 per cent. of the force. The Germans at Weissenburg lost 6·9, and at Wörth, 12·1 per cent.

With regard to the wounds, the largest number were caused by modern projectiles, both at long and short distances; the bayonet also played an important part. At Naushan men were often found to be wounded in two or three places, and in some there were as many as seven wounds. One bullet passed through an officer already wounded, and a private who was helping him; both men died. Most wounds by the small calibre bullets admitted of a very good prognosis. Those involving the muscles of the thigh, treated promptly with an antiseptic dressing, healed in a few days. In men shot through the lungs, hæmoptysis usually lasted for a few days, followed by recovery in about a fortnight. Each side made complaints of violations of the Geneva Convention, but only a few instances are mentioned.

T. P. SMITH.

The Sanitary Condition of the Russian Troops in Manchuria to the end of June, 1904.—Dr. Köcher, of St. Petersburg, gives a summary (*D. Militärärztliche Zeitschrift*, September, 1904) of the sanitary condition of the Russian troops up to the end of June. The summer rains begin about the middle of that month and exercise a decided influence. The condition had previously been very satisfactory, as shown by the figures. The numbers per 1,000 sick had been: officers, 71·36; men, 39·43; the proportion of wounded being 10·21 and 6·51. Infectious diseases accounted for only 2·19 per 1,000. After the rains had set in

this number rose to 8·52, dysentery accounting for the largest contingent. The average sick from all causes reached : officers, 83·84 and men 46·46 per 1,000.

Among the horses and cattle there were only three cases of glanders, three of Siberian plague, and nineteen of cattle plague. The generally satisfactory condition is largely attributable to the efforts of General Kuropatkin, who has taken a great interest in sanitary matters since the war of 1877-78. The results of his care were shown in the state of his column in the Achal-Jeke Expedition, and were noticed by General Scobeleff. He also took a large share in the reorganisation of the Army Sanitary Service up to the time of his departure for Manchuria. A convinced disciple of the sanitary doctrines and organisation of European armies, he did all in his power to introduce important alterations, at least as temporary measures, in the Manchurian Army. He took great pains in selecting suitable men for the various posts, and showed that success can be attained when the Chief of the Army estimates sanitary duties in a manner commensurate with their importance.

T. P. SMITH.

A Contribution to the Study of Sleeping Sickness.—In *Le Caducée*, April 16th and May 21st, D. H. Dupont, Professor at Antwerp, and recently in the service of the Congo State, gives an account of his second case of sleeping sickness in a European. The patient, a commercial agent, aged 24, was sent back to Belgium from Africa in January last, on account of his extraordinary conduct, as shown by excitement, threatening language and gestures, incoherent and false statements, and insubordination. His acts were at first attributed to alcoholic intoxication, but this view was negatived by enquiry. On January 19th, Dupont found the man markedly anæmic, walking with difficulty, haggard and excited. The abdomen, chest and back were covered with a pruriginous vesicopapular eruption. No decided alteration in spleen or liver. He had been two and a half years in Africa, and had had slight attacks of fever; his native servant had shown symptoms suggestive of sleeping sickness. He was admitted into a hospital and more carefully examined; the diagnosis was easily made. The dull and stupid look, with eyes half closed, the absence of interest in what was going on around him, the contraction of the facial muscles, suggestive of pain or uneasiness, the almost continuous somnolence, into which he speedily lapsed after being roused, sufficed to indicate the nature of the case. Other prominent symptoms were permanently contracted pupils, marked hyperæsthesia with exaggerated reflexes, polyuria, hypertrophy and induration of cervical glands; the eruption, which was almost confluent on the back and lower part of the abdomen. There was no marked change in temperature, but occasional rigors, without fever; pulse 94. March 4th, no improvement; fæcal incontinence, and nocturnal incontinence of urine; patient able to rise from his bed, but slowly and with great difficulty. On 28th, somnolence almost constant, twitchings of tendons, has not asked for food for three or four days. Only a few filariæ discovered in the blood. The cerebro-spinal fluid was examined on March 5th and 11th. After the punctures the patient appeared somewhat revived and less drowsy, but the improvement soon disappeared. After centrifuging, fixation, drying and colouring by Laveran's method, and with a magnifying power of 1,300, a few

trypanosomes were discovered, similar to those described by Dutton and Broden. The infective fluid was injected into the peritoneal sac of two guinea-pigs on March 5th and 11th. One of these died suddenly on April 4th, the other was killed on the following day. Trypanosomes, with well-developed flagella, were found in the blood. On April 2nd fever set in, the temperature rising to 38.5° C., but falling occasionally to 37° during the next few days; the pains in various parts increased in severity, and the glands became more and more swollen. Sloughs, followed by ulcers, formed over the gluteal region, on both sides, and also over the heels. After the fever set in the cutaneous eruption became dry and papular, and the itching ceased. Death occurred on May 3rd, after coma lasting forty-eight hours. The duration of the disease was estimated at three and a half months, but its onset should be regarded as simultaneous with the change in the man's behaviour, while still in the Congo territory. The administration of arsenic, in the form of sodium cacodylate, until the breath had a strong alliaceous odour, had no effect. During the later stage of the disease many trypanosomes were discoverable, both in the blood and in the cerebro-spinal fluid. The organisms varied greatly in size and form some required a magnifying power of about 3,000. Permission could not be obtained for a *post-mortem* examination.

T. P. SMITH.

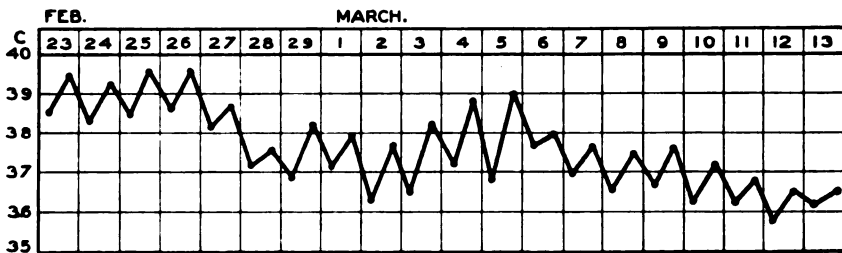
Mixed Infection of Typhoid and Paratyphoid Bacilli.—Dr. H. Conradi (*Deutsche Med. Wochenschrift*, August 4th, 1904) relates an interesting case of mixed infection from typhoid and paratyphoid bacilli, occurring in the town of Bolchen, in Lorraine.

Susannah G., aged 8, sickened on February 22nd, 1904, with fever, vomiting, abdominal pain, constipation and sore throat, after having complained of malaise for about eight days previously. On first examination, on the evening of February 23rd, the temperature in the axilla was 39.5° C., tongue thickly coated, tonsils and palatine arches reddened. There was swelling of the submaxillary glands. Abdomen not distended or painful, spleen not palpable, but the splenic region was tender on pressure. Gurgling in right iliac fossa. The bowels acted three or four times on each of the first three days, stools not loose, nor characteristic. On February 25th several well-marked rose spots were visible on the chest. There was now tympanitic distension, and pain in the ileo-cæcal region, but without dulness or resistance in the latter region. Obstinate constipation appeared. On February 26th a bacteriological examination of the stools was undertaken, and besides numerous typhoid bacilli, isolated colonies of paratyphoid were found. On February 29th, with a renewed rise of temperature, slight stupor and drowsiness occurred. On March 2nd enlargement of the spleen was noted. The accompanying chart shows the course of the fever.

The pulse during the febrile period was slow (80), but in the afebrile period, and during convalescence, somewhat accelerated (120). No lung or kidney complications, not even bronchitis. Emaciation occurred, but was quickly restored on the termination of the fever.

This, then, was a case of typhoid characterised by irregular fever, splenic enlargement, rose spots, slight gastro-intestinal disturbances, and diminished pulse rate. From the clinical standpoint, the only peculiarity was the irregular temperature curve.

Conradi then discusses the results of the bacteriological examination, which was conducted in accordance with the method elaborated by V. Drigalski and the author. Typhoid and paratyphoid bacilli were, as already stated, cultivated side by side on the same agar plate. The number of colonies of the latter was small in comparison with those of the former; on the third well-distributed plate, amidst about 200 surface colonies of typhoid, only five of paratyphoid grew, and a few of the *Bacillus coli*. To overlook the paratyphoid colonies, even amidst such a large number of the typhoid bacilli, resembling closely at first those of the former, was certainly not possible; for all the plates after twenty hours in the incubator were kept three days at room temperature, after which a sharp difference always occurred between the very bright glassy typhoid colonies and the peculiar paratyphoid colonies surrounded by a thick, non-transparent, slimy wall. The serum reaction was not carried out. Conradi points out that caution is essential in diagnosing a mixed infection in the case of typhoid, since the intestinal lesions peculiar to the disease favour the occurrence of secondary infections. He insists that the pathogenic agents causing the mixed infection must be shown to be present in the initial stages of the disease; and further, since it would be wrong, for instance, to argue the presence of a mixed infection in a patient suffering from dysentery, who has long recovered from an attack of typhoid, but is still excreting typhoid bacilli, that the infecting microbes must be shown to be present at the source of the infection. He states that in the above case both these conditions were fulfilled. In the first place, both bacilli were shown to be present in the stools on the fifth day of the illness; and secondly, he was successful in tracing the common origin of the double infection.



On February 12th the little patient had been playing about a fountain, the water of which was then frozen, and had sucked small pieces of the ice. This fountain was fed from a reservoir, about 70 metres distant, which was supplied in its turn from a brook flowing open through Bolchen—the Samborn Canal. In the fountain typhoid and paratyphoid bacilli were still to be found, eight days after the commencement of the patient's illness. Later, the same bacilli were shown to be present not only in the reservoir, but also in the water of the Samborn Canal. Careful enquiry revealed the fact that about a month before the patient was taken ill cases of typhoid had occurred in houses near the canal which discharged their waste water directly into the stream.

Conradi further records the following case of mixed infection, which he believes was due to contact. Dr. N., aged 29, always previously healthy, performed the duties of the medical officer at the hospital in Metz for some weeks. During that time mild cases of typhoid occurred, first among the nurses, and then among the patients. In some of these cases typhoid bacilli were found in the stools, and in others paratyphoid. To prevent the spread of the epidemic the evacuations of all persons coming in contact with the patients were submitted to repeated examination. In the case of Dr. N., an examination of the stools undertaken on March 3rd, 1904, showed the presence of both typhoid and paratyphoid bacilli, notwithstanding the fact that during the whole period of his residence in Metz, as well as later, he had not noticed anything amiss as regards his health. The number of colonies of both kinds was about the same, amounting to from three to five on each plate. In harmony with the complete absence of clinical symptoms, the serum reaction undertaken on the same day showed the complete absence of agglutination, both with the typhoid and paratyphoid, even in the dilution of 1 in 30. The presence of both microbes in the stools was confirmed by a further examination eight days later, each plate showing two or three colonies of each bacillus. On the other hand, the serum test repeated on March 30th gave a negative result.

The writer points to the epidemiological importance of a mixed infection with typhoid and paratyphoid bacilli, such as the above, occurring without clinical symptoms, a subject already dealt with by V. Drigalski and the author for typhoid, and by V. Drigalski, Jürgens and the author for paratyphoid.

G. COURTS.



Correspondence.

BILHARZIA HÆMATOBIA.

TO THE EDITOR OF THE "JOURNAL OF THE ROYAL ARMY MEDICAL CORPS."

DEAR SIR,—In answer to your letter of February 5th, asking for particulars of my case of Bilharzia Hæmatobia occurring in the person of Private Jeremiah of the 1st S.W.B., I may state that the case aroused much interest here owing to the rarity of such cases in North India. The ova were first noticed by myself while examining the urine under the microscope, and verified by Major A. O. C. Watson, R.A.M.C., and I saw them again several times on subsequent occasions. The man had been four years in India, and had never been to Egypt or South Africa.

There was another case of bilharzia in the regiment, but in a different company. Private Jeremiah was unacquainted with the man. The only time they could have come in contact with each other was in the hospital on May 6th, on which day Private Jeremiah was admitted to hospital for fever, while the other patient and two more who were passing through from Multan (all bilharzia cases), were transferred to Murree on the same date. These men had all been in South Africa, and there are now several more cases at Multan in the men of the Royal Munster Fusiliers. Urine and fæces were all burnt while the men were in hospital, so it would seem unlikely that he should have become infected in hospital. Also it is supposed that the ova of bilharzia must pass through an intermediate host before they can develop in man again. It is difficult to imagine any host in Mian Mir which could convey the infection from one man to another in a different company. One might suspect the swimming bath, only Private Clarkson (the first case of bilharzia) was in hospital from March 29th until he left, and at that date the swimming bath would not be open. So the matter remains a mystery, and we are quite at a loss to find any explanation for it.

There have been no further cases since then.

Mian Mir, Punjab,
March 8th, 1904.

Yours faithfully,
E. P. SEWELL.

TO THE EDITOR OF THE "JOURNAL OF THE ROYAL ARMY MEDICAL CORPS."

DEAR SIR,—On the suggestion of Dr. Balfour, the head of the research department of the Sudan College here, I have been trying "chrysoidine" in small doses as a treatment for the bilharzia so common among the Egyptians, and it appears to have most promising effects, so far. The chrysoidine has been given in $\frac{1}{4}$ gr. doses, in pill, three times a day, and continued until the urine becomes a bright yellow, the yellow colour being quite distinct from the natural yellow colour of urine. Two cases are being treated at present, and they have been taking the pills now for many days without any toxic effects becoming apparent. The ova still being passed by these men appear to have undergone some

change, when examined under the microscope, and in most cases show crenation round the edges. One of the cases, which has had severe symptoms, is now very much improved. It is, of course, as yet impossible to say if it is of any use, but we hope to try a series of cases, and will report the results to the JOURNAL.

Khartoum,
May 12th, 1904.

Yours, &c.,
HOWARD ENSOR.

THE "CONGO FLOOR MAGGOT."

TO THE EDITOR OF THE "JOURNAL OF THE ROYAL ARMY MEDICAL CORPS."

DEAR SIR,—I have duly received yours of yesterday, with reference to the flies sent home by you from Uganda and bred from larvæ in the laboratory at Entebbe, and the flies and larvæ brought by Christy from the Congo, and now known as the "Congo Floor Maggot." There is absolutely no doubt whatever that all these belong to the same species. *Auchmeromyia luteola*, Fabr., which is very widely distributed in Africa, and ranges from Nigeria to Natal. I do not think that there is any chance, as you suggest, that Christy, Dutton and Todd got hold of a fly that does not belong to the maggot, for I understand that they bred many specimens from the larva. It is certainly somewhat remarkable that you heard nothing of a blood-sucking maggot in Uganda, where you say the fly was common, as, indeed, it appears to be wherever it occurs. It is just possible, as I told the Liverpool people, that in some cases the larva may be a *subcutaneous* parasite instead of a blood-sucker, and this might account for your not having heard of a blood-sucking larva in Uganda.

Lelean thought that he found the larva as a subcutaneous parasite at Maradi, in North Nigeria. On the other hand, if the larva ever lives subcutaneously at all, it would be more reasonable to suppose this change of habit to occur exceptionally in individual cases, rather than, as the rule, throughout an entire country, such as Uganda.

British Museum, Cromwell Road,
October 8th, 1904.

Yours, &c.,
ERNEST E. AUSTEN.

Journal
of the
Royal Army Medical Corps.

Original Communications.

A REPORT UPON THE TRANSPORT OF THE SICK AND
WOUNDED IN THE FIELD.

BY MAJOR T. P. JONES.

Royal Army Medical Corps.

"AN efficient transport is so essential for the ulterior result of all military operations, whether on a large or small scale, that no pains should be spared to ensure this essential element of success to every commander." These remarks, quoted from Colonel Furse's work on "Military Transport," are peculiarly applicable to the medical service, for it is universally agreed that an efficient transport for the sick and wounded is of the highest importance, both in removing the wounded from the battlefield and in preventing the accumulation of non-effective soldiers with the force.

Our present system, although on the whole it works well, still does not seem to me to make sufficiently ample provision to meet the varying conditions of warfare; for instance, the ambulance transport with cavalry is the same as that for infantry, and there is no special provision for sick transport on the lines of communication when railways are not available. Furthermore, when the troops are split up into small columns as was the case at the end of the South African War, our present system does not lend itself readily to the ambulance requirements of these small forces.

I propose in this paper to consider the transport of the sick and

wounded from the front, down to the stationary hospitals or posts on the railway.

I shall discuss this subject under the following heads:—

- (A) Equipment.
 - (1) Stretchers.
 - (2) Ambulance vehicles.
 - (3) Country carts.
- (B) Organisation and method of working in the field.
 - (1) Regimental stretcher bearers.
 - (2) The Field Medical Unit: (a) For Cavalry, (b) For Infantry.
- (C) For Lines of Communication.
 - (3) Ambulance transport in mountain warfare.
 - (4) General observations.

A.—EQUIPMENT.

(1) *Stretchers.*

The present pattern field stretcher (Mark 5), is very strong and serviceable and does not leave much room for improvement. Its poles could, I think, be made slightly lighter without seriously impairing its strength. The pillow is not essential for field service, it adds greatly to the bulk of the closed stretcher and its place can generally be taken by some improvised article. A fold of canvas forming a bag, as in the "Furley Stretcher," or the ordinary valise, might be added; it can readily be stuffed with grass, straw or some other soft material, and made into a comfortable head-rest.

A stretcher similar to the Mark 5, but fitted with a hood and with four side handles, was also used during the last South African Campaign. The great drawback to this stretcher is its weight. The hood is no doubt a great convenience but, if necessary, some protection from the sun can be extemporised and the side handles are not really required.

I have often found it necessary to have stretchers sent long distances by mounted orderlies, and on these occasions I have noted the great difficulty in carrying the ordinary stretcher on horseback. I therefore consider it essential that a certain number of folding stretchers should be provided for work with mounted troops.

The stretcher which I am proceeding to describe was originally designed for carriage on a bicycle, but I have made experiments with it on horseback and have found it well adapted to the purpose. The stretcher consists of two jointed poles and two traverses to which the canvas is attached (*vide plate*). The poles are of ash, one

and a half inches in diameter, and have hooks along their length. They are fitted in the centre with a hinged socket joint carrying a strut, to which two steel rods are attached. These, when the poles are extended, act as tension bars, thus giving great strength to the light poles. The canvas is provided with "D"-shaped eyes on each

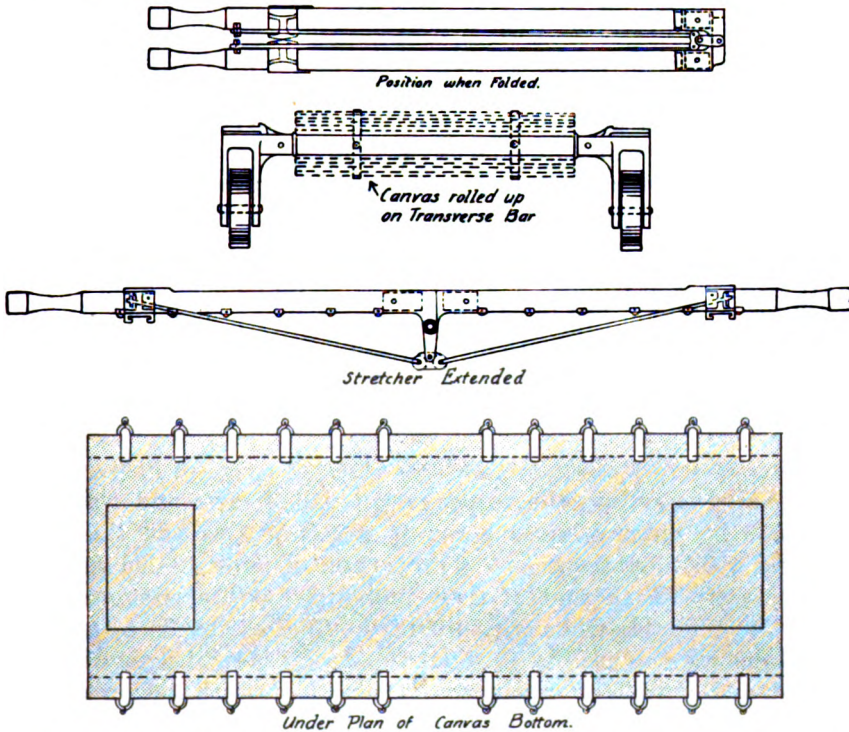


DIAGRAM OF FOLDING STRETCHER (HARDCASTLE'S PATENT) SUGGESTED FOR USE WITH MOUNTED TROOPS.

side, which fit on the hooks of the poles. At each end it is attached to the traverses, which are provided with rollers, and fit into slots on the poles, the necessary tension being provided by a metal key.

The dimensions and weight of this stretcher are as follows:—

Length of poles when extended	...	...	7 ft. 9 ins.
Length of canvas	...	...	6 „ 4 „
Width of canvas	...	...	1 „ 11 „
Weight of jointed poles, 6 lbs. each	...	...	12 lbs.
Weight of canvas and transverse bars	...	...	8 „
Total weight	...	...	20 lbs.

The mode of carrying this stretcher on horseback is well seen in the photograph. The poles are doubled and slung one on each side by means of a leather strap, which is passed twice round the pole and secured to the "Ds" of the saddle. The canvas is rolled up on the traverse bars and fastened behind the saddle by the cloak straps. The method of slinging the poles is the same as that used by signallers in carrying their heliograph tripod.

Stretchers and conveyances borne by men are the most comfortable class of sick transport, but their use is limited by the numbers of bearers which are required and the difficulty of providing for them. They are most used in wars in the East, when a large number of natives accustomed to the work are available. Thus in the war between China and Japan the land transport was almost entirely by means of stretchers (Report by Sir W. Taylor, K.C.B., on the medico-military arrangements of the Japanese army in the field). Similarly in our Indian campaigns dhoolie bearers are utilised both on the field and on the lines of communication to the railway, conveyance by vehicles being reserved for cases which are not serious.

(2) *Ambulance Vehicles.*

A controversy into the respective merits of carts and waggons need not be entered upon here; it will suffice to say that, for working with mounted troops, a proportion of two-wheeled vehicles are necessary on account of their mobility, but that waggons are infinitely preferable when with infantry. The essentials of a good ambulance waggon are that it should be strong, of light draught, easy to load, and capable of transporting the patients with the minimum of discomfort. It should be able to contain four lying-down cases on stretchers, or twelve men sitting up. It should be of a distinctive shape from all other army vehicles, as the red cross, however large it may be, is difficult to distinguish at long range. Besides this there must be space for kits, and provision for the carriage of water and a small amount of dressings and medical comforts. It must above all be capable of going over any ground that the other transport can go over.

These conditions are easy to enumerate, but no waggon which satisfactorily fulfils them has yet been tried in the field. I shall here briefly notice some of the best known types which have lately come under my observation.

Ambulance Waggons Mark 3 and Mark 5.—These are too familiar to need a detailed description. Taking them all round they

are most useful vehicles and well adapted to their purpose. They are often supposed to be most uncomfortable to the patients, but due allowance is not always made for the nature of the ground passed over; wheeled transport over rough country or on bad roads can scarcely fail to cause great suffering to badly wounded men. The objection usually made is, that in these waggons comfort has been sacrificed to strength, but I am of opinion that they are quite as comfortable as any form of ambulance waggon which was used in South Africa, and there is no doubt that they best stood the hard work of the campaign. It would be a great improvement if both these waggons were fitted with rubber-tyred wheels. The weak points peculiar to each I have found to be as follows:—

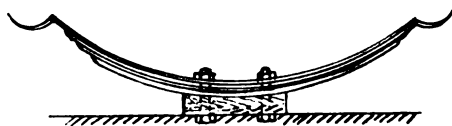
Mark 3 Waggon.—The defects in this waggon are: (a) It only carries six patients; this is caused by there being no arrangement by which seats can be provided in the space for lying-down cases, should sitting-up accommodation be required; (b) it takes some time to load with lying-down patients as the back board has to be removed; (c) the fore-carriage is liable to be detached from the body owing to the absence of a connecting pole between the fore and rear carriages, and the brakes are not strong enough.

Mark 5 Waggon.—This is a good strong waggon but might be improved in some particulars. I have noted the following defects with regard to it: (a) There are no lockers to carry spare dressings or medical comforts in. This is a great drawback; lockers could easily be arranged beneath the floor of the waggon, or on each side as in the Mark 3 waggon; (b) the drinking water is carried in a wooden cask. This should be replaced by a zinc tank; (c) The fore-carriage is not strong enough. The weak point lies in what are known as the "guides" being constructed of too light timber; if improvement was effected in these respects the waggon would scarcely ever need repairs, as, in my experience, this is generally the only part to break down. The fore-carriage also does not lock under, hence the waggon is difficult to turn; (d) the brakes are ineffective. This is a serious defect necessitating the frequent use of the drag shoe, which besides being troublesome to adjust and take off, causes discomfort and jarring to the patients.

Ambulance Waggon Used by the New South Wales Army Medical Corps.—This waggon bears a close resemblance to our own Mark 5, and is capable of containing the same number of patients. It is hung low; this, while increasing its stability, is a disadvantage when rivers have to be forded, the water in this case soon rising over the floor. There is an excellent arrangement inside the waggon by

which the jolting is much minimised. Two springs are clamped to the floor of each compartment, and on these the field stretchers rest, their handles lying in sockets at the extremities of the springs.

Ambulance Waggon built by the Gloucester Waggon Company.— I notice this waggon as it was extensively used in South Africa, having been brought out by some of the private hospitals. It affords accommodation for the same number as the Mark 5 service waggon, but possesses the advantage of being of lighter draught, weighing only 17 cwt., so that it can with ease be drawn by six mules. Its durability has however been sacrificed to attain this end, and my experience with this waggon is that it is not sufficiently strong to stand



ONE OF THE SPRINGS FOR SUPPORTING A STRETCHER.

hard field work. It does not afford more comfort to the patients, and the height of the floor, which is 3 ft. 8 in. from the ground, makes it more unstable than the service patterns. Another disadvantage is that, when it is loaded with lying-down cases, the stretchers are not separated by a partition. It is well fitted with lockers, and the arrangement for carrying water is an excellent one. This consists of two cylindrical receptacles of block tin strapped to the sides of the waggon.

Two-wheeled Ambulance Vehicles.—Of these the tonga is the most suitable type. This vehicle, as used for sick transport in India, is fitted for bullock draught and is larger and heavier than the ordinary pattern. It carries four men sitting up or two lying down, this being provided for by an ingenious arrangement for lowering the centre board and extending the seat so that a level floor is prepared. At the commencement of the late war, some of these were brought over to Natal by the field hospitals with the Indian contingent, but not being adapted for rapid work, they were useless for mobile columns and their small capacity was against their employment on sick convoys. The ordinary form of tonga was, however, used with great success, the pattern being that which is commonly used in the Punjab. This tonga is able to carry one man lying down on a stretcher and two men sitting up, or four sitting-up cases. It is not a good conveyance for a lying-down

patient, some method of lashing the stretcher having to be improvised; an improvement in this respect might, I think, be effected on the lines of the "Indian Ambulance Tonga" which I have noticed above. It is best drawn by two mules of the size supplied to mountain batteries, and in this way I had mine equipped; one driver is then sufficient and the handiness of the vehicle is increased. A great advantage of the tonga is that being hung low and almost impossible to upset, it can traverse any country. In addition to this it is easily driven, a point of great importance when travelling over difficult ground, or on night marches, when a long team of mules is most difficult to handle. It is invaluable on the line of march when it is necessary to pick up a man quickly who has fallen far out on the flank.

During the recent Boer War, a number of these vehicles were sent over by Dhanjibhoy of Rawal Pindi, fully equipped with their own drivers and ponies. First sent to the cavalry division where they proved of great service, they were afterwards used with most of the small mobile columns employed in clearing the country.

(3) *Country Carts.*

In every war it has been found necessary to use local conveyances as auxiliary transports, and, when suitably fitted up, some of these can be made useful vehicles for the conveyance of the less serious class of cases. In South Africa ox trek waggons and Cape carts were thus often employed. The Cape ox waggon is eighteen to twenty feet long and four feet broad, and can with ease carry four men lying down or sixteen sitting up. It has no springs, but a fair amount of comfort can be secured by the liberal use of mattresses and pillows, or by fitting up a frame called a "cartel" inside the waggon. Over grassy country these vehicles moved smoothly, their great weight crushing through the small inequalities of the surface, but over rocky ground they caused great suffering. Cape carts were often used when no other two-wheeled vehicles were available; they were fitted up by having the seat made removable, so that a stretcher with a lying-down patient could be received. Though occasionally found useful, yet they had not much to recommend them, as they are very rough and quite unfit to carry a serious case in; they are also easily upset.

Waggonettes fitted with hoods are common in South Africa and were much used for sick transport during the late War. They vary in size, but can generally contain six men sitting up, or, if the internal fittings be removed, two lying-down patients without

stretchers. They are strongly built, with good springs, and the hood forms an efficient shelter.

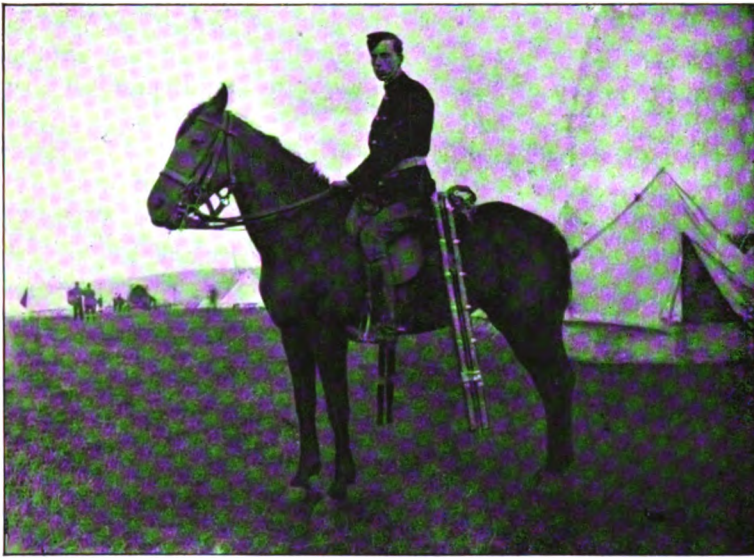
B.—ORGANISATION AND METHOD OF WORKING IN THE FIELD.

(1) *Regimental Stretcher Bearers.*

Regimental sick transport should be limited, as it is now, to the provision of stretcher bearers; wheeled sick transport, though advocated by some, is, I think, unnecessary as a part of regimental equipment. There are no doubt many occasions, such as the battalion being detached or being on rear guard, when an ambulance wagon is required by the officer in medical charge, but in these cases the necessary transport can be lent by the Bearer Company or Field Medical Unit.

Regimental stretcher bearers ought always to be unarmed, and should hand in their rifles at the beginning of a campaign; the present regulation, by which the bearers march fully armed and exchange their rifles for stretchers at the commencement of an action, cannot be carried out. As a general rule in action, the duty of all regimental stretcher bearers should be confined to applying first aid and bringing the wounded into shelter; carrying men to the rear under a heavy fire is impracticable and will only cause heavy loss to the bearers and possibly further injury to the wounded, while bringing them back long distances is to be deprecated on account of the length of time the bearers will take to rejoin.

Cavalry.—The present number of stretcher bearers, namely, four per squadron, is sufficient; each bearer should be equipped with a folding stretcher of the pattern I have described, and in addition should carry some of the appliances invented by Lieutenant-Colonel Hathaway, R.A.M.C., for supporting wounded men in the saddle; a stretcher with each bearer may seem superfluous, but it ensures a sufficient number in case of breakage or loss. In cavalry actions, slightly wounded men are often brought in on their own horses; if necessary a comrade can ride on each side of the patient to support him, a method which was usually practised by the Boers. It is essential that all cavalry stretcher bearers should be well mounted. The French, recognising the wide extent of ground that has to be covered, do not employ any regimental stretcher bearers with cavalry, the wounded, after the necessary dressings have been applied, being supposed to await the arrival of the "ambulance." No doubt if the cavalry are advancing against a retiring enemy this will often be the best plan, but still there are many occasions on which it would entail great hardship on the wounded.



PHOTOGRAPH SHOWING METHOD OF CARRYING ON HORSEBACK.

To illustrate paper by Major T. P. JONES.

Infantry.—The present proportion of stretcher bearers, namely two per company, though often inadequate, is all that it is feasible for a regiment to supply. Instead of being detached with their companies, these should, while on the march, move as a party in rear of the battalion. The advantage of this is that the stretchers can then be carried on the Maltese cart, thus saving the men's strength—a point of the utmost importance. Before an action, or should the companies become scattered, the bearers can easily take their stretchers from the cart and rejoin.

Artillery.—Two stretcher bearers, as at present allowed, are sufficient for each battery, as, when the battery is split up, stretcher bearers, if required, can be supplied by the escort to the guns. Furthermore, as a general rule, artillery are within easy reach of the Field Medical Unit.

(2) *Field Medical Unit.*

It has, I think, been the opinion of most officers who have lately served in South Africa that the present Bearer Companies and Field Hospitals should be amalgamated. By forming them into a single unit, as in India, much of the difficulty attending the transport of the sick on the line of march would disappear, the work would be more evenly distributed, and some slight economy in the *personnel* would be effected. A Field Medical Unit, capable of being divided into sections, each complete with the requisite means for the transport and the treatment of the sick and wounded, must be considered the most efficient organisation, especially when there is a possibility of the force to which it belongs being split up into small columns. I should further recommend that the *personnel* for the wheeled transport of this unit should be provided by the Royal Army Medical Corps, and that all the horses, waggons, &c., should be in the charge of the officer commanding. In connection with this the following remarks by Colonel Furse ("Military Transport," p. 10) may be quoted: "In advocating that the transport of an army should form a branch of the commissariat we must make an exception with regard to regimental and medical transport," and again, "It will be urged against a separate transport that the medical pressure for transport is occasional, whereas with supplies it is constant. . . . Yet the importance of a separate transport for this department cannot be over-rated."

The chief objection which might be made is that the R.A.M.C. could not supply sufficient numbers for the purpose, but it is unlikely that the A.S.C. itself could ever provide a complete

personnel for medical transport from its own ranks. The solution appears to me to lie in the formation of a separate transport section of the Corps; to this it might further be objected that R.A.M.C. officers on service have not time to spare for looking after transport, but this objection must be over-ruled; the experience of the Canadian Army Medical Corps, the New South Wales Medical Corps, and our own R.A.M.C. Volunteers may be cited, indeed it appears to me that transport is so intimately connected with the medical service in war that it is impossible to dissociate ourselves from it.

On active service the advantages of the plan I have suggested would be many. The unit would be homogeneous, and the N.C.O.'s and men of the transport section, who ought all to have some training in general hospital duties, and possess an adequate knowledge of "first aid," would therefore be able to render help in an emergency. They would also all be permanently non-combatants, and the question of men discarding and re-assuming their red cross brassards would no longer arise.

To ensure efficiency, enough transport for training purposes must be maintained in peace time. This should, as far as possible, be stationed in camps or large garrisons, and might be partly used in the conveyance of sick to hospital. The transport duties of the Royal Army Medical Corps differ quite as much from those of the Army Service Corps as do the latter from the Royal Engineers, who have their own transport; and it is just as reasonable that horses and waggons should be kept for their training as that they should be so kept for other branches of the service.

Assuming, therefore, that the present bearer company and field hospital are combined into a single unit, for which the name "Field Ambulance" may be suggested as a designation, I propose that there should be three distinct types fitted respectively for service with cavalry, infantry and convoys, or on lines of communication. It may be objected that this would cause confusion by multiplying equipment, but I do not see why such should be the case any more than with artillery, where it is necessary to have horse, field, and heavy batteries, all units capable of moving at different rates of speed.

I shall now briefly consider these three different forms from a transport point of view, using the term "Field Ambulance" to denote the combined unit.

The Cavalry Field Ambulance.—The combined strength of the existing bearer company and field hospital, for a cavalry brigade is

157 inclusive of the attached *personnel* from the Army Service Corps. This is the same strength as in an infantry brigade, and the organisation and transport material are also similar.

It is, I think, obvious that not only is ambulance work in the field with mounted troops of a very different character, but also that less transport is required for a cavalry brigade about 2,000 strong, than for an infantry brigade about 4,000 strong. This was recognised in South Africa, and after April, 1900, a half-bearer company, and a half-field hospital were allotted to each cavalry brigade.

So long ago as 1882, the late Sir Herbert Stewart K.C.B., in the appendix to the report of Lord Morley's committee, wrote as follows in condemnation of the bearer company arrangements for this arm of the service: "With regard to a bearer company I consider the present organisation entirely unsuitable to cavalry. . . . I think that a mounted bearer company should take the place of the present bearer company, as far as cavalry is concerned."

CAVALRY FIELD AMBULANCE.

Proposed War Establishment.

DISTRIBUTION	RANKS						HORSES			VEHICLES					
	Officers	Warrant officers	Staff Sergeants and Sergeants	Corporals	Privates	Drivers	Total	Riding	Draught	Total	Waggons for dismounted men	Ambulance waggons	Tongas	G. S. Waggons	Forage carts
Commanding Officer..	1	—	—	—	—	—	1	1	—	1	—	—	—	—	—
General duty	2	—	—	—	—	—	2	2	—	2	—	—	—	—	—
Quartermaster	1	—	—	—	—	—	1	1	—	1	—	—	—	—	—
Sergeant-Major	—	1	—	—	—	—	1	1	—	1	—	—	—	—	—
Qr.-Master-Sergeant ..	—	—	1	—	—	—	1	1	—	1	—	—	—	—	—
Wardmasters	—	—	1	1	—	—	2	—	—	—	—	—	—	—	—
Stewards	—	—	1	1	—	—	2	—	—	—	—	—	—	—	—
Compounders	—	—	2	—	—	—	2	—	—	—	—	—	—	—	—
Pack Store N.C.O.'s ..	—	—	1	1	—	—	2	—	—	—	—	—	—	—	—
Cooks	—	—	1	1	2	—	4	—	—	—	—	—	—	—	—
Ward Orderlies	—	—	—	—	10	—	10	—	—	—	—	—	—	—	—
Clerk	—	—	—	1	—	—	1	—	—	—	—	—	—	—	—
G.O.'s Orderly	—	—	—	—	1	—	1	1	—	1	—	—	—	—	—
Detachment for Ambulance Waggons	1	—	1	3	16	8	29	17	16	33	—	4	—	—	—
Detachment for Tongas	1	—	1	3	12	4	21	17	8	25	—	—	4	—	—
Drivers of other Transport Vehicles	—	—	—	—	—	14	14	—	28	28	2	—	—	4	2
Batmen	—	—	—	—	6	—	6	—	—	—	—	—	—	—	—
Total	6	1	9	11	47	26	100	41	52	93	2	4	4	4	2

Mounted, 41; wagon orderlies, 4; drivers, 26; *personnel* carried on two waggons, 29; total, 100.

It must be admitted that it is a physical impossibility for dismounted stretcher bearers to work with rapidly moving cavalry, and in the recent Boer War it was found necessary that as many of the R.A.M.C. as possible should either be mounted or carried on waggons. It has been suggested that the remedy lies in increasing regimental aid, but I believe that the best plan is the formation of a "Field Ambulance for Cavalry" which, as I have noted above, should combine both bearer company and field hospital functions, and should also be capable of division into a right and a left half.

I attach a suggested "War Establishment" for this unit in which it will be noted that the detachments engaged in bearer company duty are mounted, while the N.C.O.'s and men of the hospital section are carried on two light waggons. It is, I think, the most efficient arrangement for cavalry, that the men who have to keep in close touch with the troops should be well horsed, while wheeled conveyance is provided for those who are engaged in hospital duties, and therefore only required to move at the same rate as the regimental transport. Another reason why it is inadvisable to mount the hospital section is that, on account of their work in camp, they would not have time to look after their horses. For ambulance transport it will be seen that I have allowed 4 four-horsed waggons and four tongas, and this ought to be sufficient. A mounted detachment of one officer, four N.C.O.'s, and twelve men accompanies the waggons, and a similar detachment the tongas; each waggon also carries a waggon orderly as usual. The waggons should each be equipped with four, and the tongas with two, stretchers of the ordinary "Mark 5" pattern; in addition to this four folding stretchers of the pattern I have described should be carried with each detachment, and each man should also carry a couple of Lieutenant-Colonel Hathaway's saddle supports.

The mode of working in action may be outlined as follows: The tongas would keep well ahead, extended on a broad front as close to the troops as possible, while the waggons would come on more slowly but still keeping touch with the brigade. If the tongas were kept well up the regimental stretcher bearers would have a very short way to fall back with the wounded and could quickly transfer them, the tonga detachment of course picking up casualties themselves when possible. Tongas when loaded would retire to the waggons or to the dressing station, should one be established, and after handing over their wounded would go forward again. The waggons would be extended, or not, according to circumstances, forming dressing stations when practicable, and would bring back

the wounded to the hospital section, if the hospital was established within reach; otherwise they would have to carry on the wounded until the end of the action.

The Infantry Field Ambulance.—This should consist of the present bearer company and field hospital combined, and, like the "Cavalry Field Ambulance," should be capable of division into a right and a left half. In this unit, therefore, the transport for sick and wounded will consist of eight stretcher squads and ten four-horsed waggons; tongas I do not consider necessary in the case of infantry. It may here be remarked that owing to both units being combined, more men can be utilised as stretcher bearers according to the judgment of the commanding officer.

The mode of working in the field will largely depend on circumstances, but as a general rule the stretcher squads must keep well up so as to relieve the regimental stretcher bearers as much as possible, and the waggons in turn must be pushed forward as far as the nature of the ground and the fighting allows. The relative distances over which conveyance by stretcher or by waggon is required will vary greatly, as was well seen in the last Boer War. In the early stages of this campaign, when our army was generally obliged to attack strongly held positions, the wounded had to be carried a long way by stretchers, but towards the close of the war, when most of the actions were against a retreating enemy, the waggons could generally be driven close to the wounded, except when rocky or mountainous ground rendered hand carriage necessary.

The Collecting Station must be regarded as obsolete; in fact, I have rarely known an occasion on which one could be formed; actions in modern warfare are fought over so wide a front that the collection of the wounded in any one place, prior to their transport to the dressing station, is seldom practicable and would only entail more suffering to the patients and labour to the bearers. The waggons, in fact, taking advantage of any available cover, must be ready to move about, pick up the wounded in all directions, and bring them to the Dressing Station.

The Dressing Station should be as close to the front as is compatible with the safety of the patients, and its position will depend almost entirely on the cover that can be obtained for it.

Conveyance of the Wounded from the Dressing Station to the Rear.—If the force is on the defensive or operating against an enemy holding strong positions, and therefore is unlikely to be moving on rapidly, the hospital section of the "Field Ambulance"

may possibly be established within easy reach ; in that case the wounded should be sent back to it as quickly as possible. However, it will more commonly be found that from various causes, such as the force advancing quickly or the brigade transport being delayed, it will be impossible to pitch the hospital tents until nightfall. Even if the hospital is established, unless it is very close, it will be inadvisable to send any waggons back to it before the end of the action ; there are at the most only ten waggons available—often less, as some may be required for sick—and their primary function must be to collect the wounded, not to send them back long distances. At the end of the day, when the site of the camp or bivouac has been selected and the hospital tents pitched, the wounded can be moved in, but until then, as a general rule, they are best kept at the dressing station.

The Lines of Communication Field Ambulance.—In most countries railways are the chief means for freeing the force at the front from the encumbrance of non-effective soldiers, but in cases where troops are operating at a distance from the line, or where there are no railways, or where these have been obstructed, it will be necessary to move large convoys by road. It is of little use to have good transport at the front unless suitable means are provided for passing the patients along the lines of communication, still for this service no definite scheme is laid down, though sometimes ordinary bearer companies or field hospitals are used, as in the Tirah campaign, where two British and two Native Field Hospitals were detailed for this duty.

Under the present arrangements there is also a heavy strain on the sick transport when a force is moving and is compelled to take its sick and wounded along with it, for various reasons, such as there being no stationary hospital within reach nor any place at which the patients can be left. If fighting is expected it is necessary to keep most of the ambulance waggons empty and ready for action, and still there are always a number of cases for which transport by ordinary vehicles is unsuitable. What is required is a special unit which might be called the "Lines of Communication Field Ambulance." The sick transport for this unit should consist of eighteen two-horsed ambulance waggons, organised in three sections of six waggons each, supplemented when necessary by empty supply waggons and local conveyances. The establishment should be calculated for a sick convoy of 150 or of 50 for each section ; no stretcher bearers need be included in the *personnel*, which should consist solely of a sufficient number of officers, N.C.O.'s and men to

look after the sick convoy on the march and in camp, together with the necessary N.C.O.'s and men for transport duty.

These field ambulances might be attached to the supply columns, and their working would therefore be largely governed by that of the ordinary convoys, according as these adopted a system of staging or of direct transit. If the staging system was employed the sections could work between the various posts along the lines of communication, as was done in the Tirah campaign where posts about 15 miles apart were formed from the front down to the railway at Khushalgar; on the other hand, if posts are not established, the system of direct transit must be employed. In civilised warfare the sick convoys could, of course, proceed independently if so desired.

The formation of special field ambulances for this service would not only prevent the medical units at the front being weakened by having to provide for their own sick convoys, but would conduce greatly to the comfort of the patients. They would also be available for the formation of temporary hospitals when an accumulation of sick or of badly wounded might render such a course necessary, and if kept in close touch with the troops would enable the field ambulances at the front to be always ready for action by constantly relieving them of their sick and wounded.

The number required for each campaign will vary greatly. Besides the strength of the Field Force the chief factors to be taken into consideration are the length of the lines of communication and the number of railways available.

(3) *Ambulance Transport in Mountain Warfare.*

Ambulance transport in hill fighting presents peculiar difficulties, especially if the war is against a savage enemy, when the failure to remove wounded may mean their death amid circumstances of great barbarity. Every endeavour must be made to remove promptly all men who fall, and bring them to some central sheltered position, as otherwise there is great danger of their being overlooked, hence the services of combatants will generally be required even at the risk of weakening the firing line. The number of wounded is not usually great, but this is made up for by the difficulty of removing them from precipitous positions. In Tirah they often had to be carried down by hand or in a blanket, six men were often required to carry one soldier with his rifle and equipment, and while doing so they were generally a target for a murderous fire. Stretchers often cannot be used at all, in fact

they are unsuitable for steep hillsides, as there is nothing to prevent the patient from sliding off the canvas. Under these circumstances it is necessary that the combatants themselves should have some ready way of carrying their wounded comrades into shelter. Such an appliance has been invented by Lieutenant-Colonel Corker, R.A.M.C. This consists of a large meshed net about twenty inches square, which, with a couple of rifles passed through it, forms an efficient contrivance for carrying wounded down steep declivities. It is light, easily carried, and might with advantage be given to troops engaged in hill-fighting in the proportion of one to each sub-section.

In the absence of any special contrivance the wounded will have to be got down in the best way possible, either on the backs of their comrades or by some extemporised means, such as in great coats or blankets. The infantry sash was formerly used for this purpose. The stretcher bearers or dhoolie bearers must, of course, keep up as close as possible, ready to remove the casualties further to the rear. A certain number of riding ponies should always accompany the force into action; they should be kept under shelter in some convenient spot, and would be utilised for the conveyance of the less serious cases into camp.

On the line of march through a mountainous country, if no wheeled vehicles are possible, the ambulance transport will consist of dandies or stretchers for the serious cases, and of riding ponies or some form of pack transport, such as mule cacolets or camel kujawahs, for the others. Mule cacolets are objected to on account of their weight; the ordinary load for a mule is 222 lbs., including the pack, saddle and bridle, but a mule carrying in cacolets a couple of men at eleven stone each, would be loaded with a total weight of 426 lbs., which, unless for very short distances, is an impossible burden for any but the best stamp of gun mule. The objection to camel kujawahs is chiefly the great discomfort they cause to the patients, on account of the peculiar gait of the camel. Saddle transport on ponies or mules is an efficient method and one that is in use in India, where eighty riding ponies are allowed to a field hospital for this purpose. It is essential that the animals should be quiet and well trained.

(4) *General Observations.*

After great battles the regular means of transport will never be sufficient, and will have to be supplemented in various ways. Thus special bodies of men may be raised, such as the Imperial Bearer

Corps, which was formed by Sir T. Gallwey, K.C.M.G., C.B., in the early period of the Boer war, and without whose help the Natal battlefields could not have been so promptly cleared. During an action the employment of combatants to remove their wounded comrades is to be deprecated, but after the fight their services may be requisitioned if necessary.

When the wounded have all been collected or when there are large numbers of sick, it is then that the real difficulty is experienced. It is important for military reasons that non-effective soldiers should be as quickly as possible removed far from the front, not only because of the encumbrance they are to the force but also on account of the uncertainty of being able to move up supplies to them. Places on the lines of communication one day are far removed from them the next, and the difficulty of providing for isolated collections of sick may be considerable.

Colonel Furse in his work on "Military Transport," on p. 183, writes: "The only efficient system is one which provides for a continual stream of patients from front to rear without interruption, for the least interruption will again bring on that accumulation of sufferers which it is desirable in the interest of the army and population to avoid." This undoubtedly should be the ideal at which to aim, but to carry it out will often strain the resources of the medical transport to the utmost.

If the line of advance is on a railway much of the difficulty disappears, thus after the battles of Belmont, Graspan, Modder River, and Magersfontein, the wounded were rapidly transferred to the base hospitals at Wynberg by means of an efficient service of ambulance trains. It may be objected that the necessary movement of the wounded largely increases their sufferings and often minimises their chance of recovery. Sir F. Treves, Bart., K.C.V.O., C.B., in his evidence before the South African War Commission, lays special stress upon this and advocates the formation of large field hospitals in the immediate vicinity of the fighting force, a measure which was carried out in Natal, where the wounded from the battles of Colenso and Spion Kop were detained for a considerable time at the field hospitals before being sent down. This is, however, only admissible when ample railway communication and facilities for forwarding supplies exist, and also when the force is not likely to move rapidly. In the Orange Free State and in the Transvaal the conditions were very different from those in Natal, and such a system would have been impracticable.

There are, however, certain classes of cases, such as abdominal

wounds and fractures of the femur, where rest is above all essential, and it is always advisable to keep these from being moved, but if compelled to travel, their sufferings may be much minimised by due care. Thus when a rocky part of the road is encountered it is a good plan to have them removed from the waggons and carried by stretcher bearers. In this way I have often seen serious cases conveyed long distances without ill effect.

In this paper I have only attempted to discuss the question of the transport of the sick and wounded by road and on the field. I have therefore not included hospital trains or transport by rail.

THE TREATMENT OF PURULENT OPHTHALMIA IN ADULTS BY CANTHOPLASTY.

By CAPTAIN ALFRED J. HULL.

Royal Army Medical Corps.

BEFORE describing so radical a treatment as canthoplasty, one may consider the result of the remedies in general use. The prognosis in patients over twenty years of age is generally admitted to be very grave. In the blind asylums of Austria and Germany, over a third of the patients owe their blindness to gonorrhoeal ophthalmia; this estimate includes the numerous cases of ophthalmia neonatorum. Over thirty, one-half sustain more or less damage to sight. Grouping all cases together, corneal mischief results in perhaps one-fourth of the cases (S. Stephenson).

During 1902 only one case of purulent ophthalmia was admitted to the wards of St. Bartholomew's Hospital in a patient over five years of age, and during 1901 only five cases of all the varieties of conjunctivitis were admitted in patients over twenty years of age.

During the years 1891 and 1892 only three adult patients were treated in the same hospital for conjunctivitis.

In the course of last year 600 patients were admitted to the Babies' Hospital, New York, among whom were seventy cases of gonorrhoeal vulvo-vaginitis and ten with arthritic symptoms; out of the whole number of patients admitted to the hospital only one case of gonorrhoeal ophthalmia occurred. (Kemball).

From these facts we may gather: (a) That purulent ophthalmia is a distinctly rare disease in adults. (b) That when it does occur, the results are liable to be disastrous in spite of treatment. (c) That even in children, with proper supervision, the spread of the disease may be absolutely controlled.

Considering the results of Piringer's observations, it is not remarkable, in spite of the frequent occurrence of gonorrhoea, that conjunctival infection is rare in adults, and that in infants the spread of the disease can be easily prevented.

Piringer found that dilution to one hundred times, and drying on linen for twenty-six hours, made the discharge inert.

History.—Great stress was laid by the older writers upon the fact that the disease is more common in men than in women. Sir William Lawrence, writing in 1832, states that "The inflammation

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of the eye called gonorrhœal is confined to males and never occurs in females.

"In the early years of the last century the possibility of the inflammation being due to inoculation with a urethral discharge was strenuously denied. Experiments were actually performed upon human beings with negative results."

Sir William Lawrence, lecturing at St. Bartholomew's in 1832, stated as regards treatment:—

"In the first instance it will be necessary to bleed the patient freely from the arm, and afterwards to take blood locally by cupping or a large number of leeches placed around the eye."

At about the same date Bier and Richter advised smearing a bougie with gonorrhœal discharge from another patient and introducing it into the patient's urethra in order to reproduce the "suppressed discharge."

Diagnosis.—After an incubation period averaging about two days, the disease becomes apparent to the patient. During the stage at which patients usually come under observation, there is swelling of the lids and a whey-like discharge from the somewhat reddened conjunctiva; or in more severe cases a tense, swollen and shiny palpebral mucuous membrane, serous chemosis of the bulbar conjunctiva, serous discharge becoming creamy, and even at this stage sometimes streaked with blood. Later, the conjunctiva of the eye-lids becomes markedly swollen, villous, and of a deep red colour; that of the eyeball swollen and forming a mound of jelly-like thickening around the cornea.

In the early stage of the disease it is obvious that it would be impossible to differentiate a gonorrhœal infection from severe catarrhal conjunctivitis becoming muco-purulent. Owing to the gravity of the former disease a bacteriological examination should be made, and upon a positive result having been made, canthoplasty performed whilst the disease is yet in an early stage. There is no need to postpone the operation, as is so often done, until excessive chemosis of the bulbar conjunctiva has occurred and strangulation of the corneal blood supply has produced corneal lesions. The operation causes the patient little discomfort, it can do no harm, and the remaining scar is invisible among the natural wrinkles at the outer margin of the eye.

Bacteriological Examination.—Having sterilised a platinum loop, when the wire is cool pick up a portion of discharge from the conjunctiva and pass the loop lightly over a cover-glass.

The specimens should be air-dried and fixed in equal parts of ether and alcohol for fifteen minutes. They may then be stained by carbol fuchsin and Löffler's methylene blue.

The reaction by Gram's method should then be determined, when the gonococci, if present, will be found to be decolourised and to have taken the counter-stain.

Culture Methods.—Plate cultures of agar smeared with blood, and another set of agar only, should be prepared and incubated at 37° C. In forty-eight hours colonies of the gonococcus should be recognisable on the blood agar but not on plain agar.

The gonococcus is the only organism which possesses all the three following characters: (a) Occurrence in cell colonies in pus; (b) decolourised by Gram; (c) inability to grow at 37° C. on agar (Foulerton).

Operation.—Before commencing the operation the operator's eyes should be protected either by goggles or a veil of ordinary antiseptic gauze. The operation was first described by von Ammon for the treatment of ankyloblepharon, and has since been recommended by various authors as a means of relief in cases of extremely swollen lids in purulent ophthalmia. It is to draw attention to its great prophylactic use as a routine measure that this article has been written.

Having cleaned the skin around the affected eye, the healthy eye having been protected by a Buller's shield, the operation may be performed either with or without a general anæsthetic. A local anæsthetic may be used if desired. Cocaine and eucaine do not act well upon inflamed tissues, and for other reasons are not particularly suitable for this operation. Ethyl chloride may be used to freeze the tissues at the seat of operation. A flat piece of vulcanite or ivory, about 10 mm. wide and 3 mm. in thickness, should be pushed under the lids and the outer canthus to protect the eye from the effects of the evaporating liquid if this method of anæsthesia is employed. Either nitrous oxide or somnoform are the most suitable anæsthetics. A pair of long-handled scissors with blunt-pointed blades, 30 mm. long and 4 mm. wide, is the most convenient instrument to use for the operation. The two lids are separated widely by the fingers so that the external commissure is put on the stretch, and the lower blade of the scissors slipped under the outer commissure and pushed outwards as far as it will go, being kept in contact with the palpebral mucous membrane. The tissues between the blades are then cut through in a horizontal direction by closing the scissors. The outer commissure is apt to slip somewhat from between the blades, thus making a smaller incision than was intended. Placing the first and second fingers of the left hand on the upper and lower lids and firmly holding the commissure between

the blades, somewhat obviates this difficulty. If the tissues have slipped much the incision must be carried further outwards by a second snip of the scissors. Upon separating the lids a rhomboidal wound is exposed to view. Local depletion being beneficial, hæmorrhage should not as a rule be controlled.

There is probably no operation in surgery by which a simple incision affords so great relief as canthoplasty. The tense lids no longer press upon the globe, the strangulated chemosed bulbar conjunctiva is relieved from pressure, the pent up discharge in the fornices is freed, the conjunctiva and cellular tissue are opened, and blood is locally depleted. The whole of the conjunctiva can be examined and treated. The greatest care should be taken in examining the fornices and the corneo-scleral margin. If much chemosis is present the conjunctiva at the corneo-scleral margin should be carefully lifted to expose the cornea. The discharge must be most carefully removed from this fold, preferably by irrigation at frequent intervals, *i.e.*, every hour, or keratitis will most certainly occur. The operation having been performed, the best results are obtained by continuous irrigation with weak antiseptic solutions and the application of 50 per cent. protargol.

Swanzy recommends, if the chemosis, palpebral swelling and rapidity of onset are severe, that the patient should be placed rapidly under the influence of mercury, as in his opinion by these means the chemosis is rapidly reduced and one source of danger to the cornea avoided.

Should ulceration of the cornea occur during the course of the disease, it is certainly more amenable to treatment when canthoplasty has been performed. Some differences of opinion exist as to the effect of the cautery upon these ulcers. Some surgeons consider that as the source of infection is not removed, as in the case of ulcers occurring without conjunctival disease, the cautery is contraindicated. On the other hand in practice one finds that if canthoplasty has been performed and continuous irrigation employed, cauterisation of an ulcer is followed by a good result.

EAST COAST FEVER.

By DR. A. THEILER.

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THIS disease was first heard of in the Transvaal in May, 1902, when a heavy mortality amongst cattle was observed in the Elands River Valley, especially in Nelspruit and Komatipoort. Its nature was, however, not recognised, and it was generally mistaken for rinderpest.

The spread of the disease and the heavy mortality caused a thorough investigation, the result of which was laid down by me in an article, "The Rhodesian Tick Fever," in No. 4 of the *Transvaal Agricultural Journal*, 1903. The malady was described under different names, as Rhodesian Redwater, Rhodesian Tick Fever, and lastly, Professor Koch proposed the name of East Coast Fever. It was generally accepted that the disease started from the East Coast of Africa, more accurately, German East Africa, where it was first observed by Professor Koch in 1897, and who then described it under the name of Texas fever, he being then under the impression that the peculiar small piroplasmata which are found in the blood corpuscles were young forms of the *Piroplasma bigeminum*, the cause of Texas fever or redwater. When the disease made its appearance in Rhodesia it was still believed to be identical with redwater; further, it was thought that the ordinary redwater had acquired a very high virulency, and therefore altered in type. This theory was based on the fact that the disease first appeared in a herd of freshly imported Australian cattle (about a thousand), which were not immune against ordinary redwater or Texas fever, and which finally completely succumbed. At the same time it was noticed that a certain number of cattle showed, during life, the symptoms of hæmoglobinuria, and on *post mortem*, lesions corresponding with those of Texas fever; and the examination of the blood proved the presence of the typical *Piroplasma bigeminum* in addition to the bacillary piroplasma, as already described. The same observations were also made in the Transvaal. The fact, however, that the disease carried off the immune low veldt cattle in the same way as the high veldt cattle suggested the supposition that although the disease resembled Texas fever very much, yet it might be another and a new disease. The experiments undertaken for this purpose gave the following results:—

(1) Cattle which are immune against redwater, or Texas fever, such as low veldt cattle, Madagascar cattle, Texas cattle, and Queensland cattle, contracted the disease and died.

(2) Transvaal cattle, which had been hyperimmunised against rinderpest in the first instance, and then against ordinary redwater to the extent of 8,000 cc. virulent redwater blood, contracted the disease and died.

(3) Cattle which were known to be immune against redwater showed, on *post mortem*, lesions of redwater, and in their blood the *Piroplasma bigeminum*, together with the bacillary piroplasma.

(4) A certain number of cattle did not show *Piroplasma bigeminum* in their blood.

(5) The average incubation period after exposure to natural infection was about twelve days; the average course of the temperature reaction was thirteen days. The shortest period of incubation was ten days, the longest was twenty days. The shortest course of the disease was five days, the longest period was twenty days.

(6) The majority of the animals which had *Piroplasma bigeminum* in their blood showed the symptoms of hæmoglobinuria, and the majority of animals which only had the bacillary form of piroplasma present did not show these symptoms.

(7) The count of red corpuscles during the fever reaction showed the remarkable fact that, in the majority of cases, there was no decrease of red corpuscles, or only a very slight one.

(8) The susceptibility of cattle to the disease was 100 per cent., and the mortality averaged 95 per cent.

(9) The disease proved not to be contagious; healthy cattle placed in stables alongside sick cattle did not contract the disease.

(10) The *post-mortem* lesions in cases of infection by bacillary piroplasma differed from ordinary redwater in the majority of cases.

(11) The inoculation of blood into susceptible cattle taken from sick cattle, which contained the bacillary piroplasma in great numbers, did in no instance in a series of thirty experiments produce the disease. The sick blood was injected in quantities of 5 cc. to 2,000 cc.

(12) Cattle which had thus been treated acquired no immunity; they contracted the disease after they were exposed to natural infection.

(13) Cattle which were injected with blood of immune oxen did not show any reaction due to the injection of such blood, neither did they acquire any immunity therefrom.

(14) Cattle which were injected with serum of immune oxen did

not acquire any passive immunity when exposed to natural infection; they died as rapidly as did the controls.

(15) Animals which have recovered from East Coast fever have acquired a permanent immunity.

Conclusions.—The disease has nothing to do with Texas fever or redwater; it is a new disease, due to a piroplasma different to the one found in Texas fever. The observation that both piroplasmata are found together in the same animals is explained by the fact that almost all animals which hitherto contracted the new disease were born in a country where redwater also existed, and they naturally were immune against redwater. Immunity to redwater differs from immunity acquired by recovering from a disease caused by bacteria, inasmuch as in the former case the blood remains infective to susceptible animals. The piroplasma must, therefore, still be present in the blood (*vide* article, "The Piroplasma of the Immune Ox," November Number JOURNAL OF THE ROYAL ARMY MEDICAL CORPS). Now when such an animal comes under adverse conditions, as for instance in contracting a virulent fever, its immunity breaks down and the piroplasma reappears under its normal shape and complicates the disease. Such observations were made in connection with rinderpest especially. Even exposure to fatigue may cause the reappearance of *Piroplasma bigeminum* in the immune animal. The complication of East Coast fever with Texas fever can only be explained in this way. The observation that *Piroplasma bigeminum* generally appears only towards the end of the fever reaction in East Coast fever supports this view. The main difference between Texas fever and East Coast fever is the fact that the former one is inoculable into susceptible cattle and the latter one is not, and, again, that the blood of redwater immune cattle is still infective, whilst immune East Coast fever blood is not infective.

Other diseases due to piroplasma, such as piroplasmosis of the dog (malignant jaundice), piroplasmosis of the horse (biliary fever), behave similarly to Texas fever. Both the sick and recovered blood produce the disease when injected into susceptible animals. We can, therefore, distinguish two groups of piroplasmosis: one which is inoculable and to which belongs the Texas fever of cattle, the biliary fever of the equine species, and of the dog. All these diseases are caused by a piroplasma which is much larger than that found in the uninoculable East Coast fever. The East Coast fever piroplasma, commonly called the bacillary-shaped one, represents, therefore, quite a different species, and I propose to call it by the name of *Piroplasma parvum* (n. sp.).

I.

THE TRANSMISSION OF EAST COAST FEVER BY TICKS.

From analogy to other diseases of stock, due to the presence of piroplasmata in the blood, we concluded from the outset that East Coast fever must be propagated by ticks. All evidence pointed to this fact. It was demonstrated that the disease is not of a contagious character, since it attacks cattle only in certain localities where previously infected cattle have sickened or died of this disease. Consequently it was common knowledge that these regions became more or less infected. When apparently healthy cattle which had only been a short period on infected ground were removed out of such areas, then they began, after a lapse of some time (usually about twenty days later), to sicken and die. Although these sick cattle, which were running on a clean farm, mingled with healthy cattle, no immediate outbreaks of disease occurred amongst the healthy stock. Some weeks later, however, the same healthy cattle which had been grazing over the same farm began to sicken and die of the same disease. A direct infection had accordingly to be excluded: the infection had to pass through the pasture. A similar observation was already known in connection with Texas fever, where a certain species of tick (*Rhipicephalus annulatus* [*Boophilus bovis*]) was found to be the intermediate host of the infection. Accordingly, our task was to find out the right species of ticks which would act in the same manner. It was, in the first instance, our object to ascertain what species of ticks infected such parts of South Africa where East Coast fever was rampant. In the different samples of ticks sent by district veterinary surgeons, and in those collected by myself in various outbreaks, but more especially in those of the low veldt, I found the following species in varying numbers:—

(1) *Rhipicephalus decoloratus* (Koch), the common blue tick of South Africa.

(2) *Rhipicephalus appendiculatus* (Neumann), now commonly known by the name of the brown tick.

(3) *Rhipicephalus simus* (Koch), designated by Loundsbury as the black-pitted tick.

(4) *Rhipicephalus evertsi* (Neumann), the red tick.

(5) *Amblyomma hebraeum* (Koch), the tortoise-shell or variegated tick, especially known as the Bont tick.

(6) *Hyalomma aegyptium* (L.), the striped leg tick, known by the name of the Bont leg tick.

II.

The ticks enumerated above belong to three different genera of the family of *Ixodidae*, viz., *Rhipicephalus*, *Amblyomma* and *Hyalomma*. The life-cycle of every species is now well known, thanks mainly to the investigations of Lounsbury. The life cycle of a tick embraces the following stages: (1) Egg; (2) larva; (3) nymph; (4) imago, adult or sexual tick.

It is advisable to begin with the description of the habits of the sexual forms. Males and females meet on a host. After feeding they seek each other for copulation. In some species the males seek the females, which remain attached to the animal; in others the reverse takes place. Males and females are usually the same size, but after fertilisation the latter begins to engorge enormously. This is the tick commonly spoken of by farmers. The male may be found alongside the female, and compared to the fully-engorged female is very small. This led to the popular South African opinion that these tiny males were young ticks. The female repletes herself very quickly, she detaches and drops to the ground. Usually she hides in grass or in soft ground. After a lapse of a certain period, which varies according to the different species, the female begins to lay eggs. This process also varies in length of time, according to the species of the female. After the lapse of some weeks or months the eggs begin to hatch and young larvæ appear. These larvæ soon crawl to the next grasses and bushes, from whence they attach themselves to the first suitable host which may pass.

So far all the above-mentioned species of ticks behave similarly; some difference now enters into their habits, according to which we can divide the ticks into three biological groups:—

(1) *Ticks with One Host*.—The tick which in the form of a larva attached itself to the host, undergoes on the same animal its complete life-cycle, and accordingly leaves the host as an imago, that is, a sexual tick.

(2) *Ticks with Two Hosts*.—In this case the tick remains on the same host during the first two stages in its life-cycle. It comes on as a larva and leaves as a nymph. The nymph moults on the ground, and the resulting adult tick has to find a new host. (*Rhipicephalus evertsi* and *Hyalomma aegyptium*.)

(3) *Ticks with Three Hosts*.—Here the tick leaves the host in each stage, and for the completion of the life-cycle three hosts are required. (*Rhipicephalus appendiculatus*, *Rhipicephalus simus* and *Amblyomma hebraeum*.)

Regarding the details in the life-cycle of the different ticks, the following notes may give some information. A zoological description of the several species mentioned does not enter into the spirit of this paper.

(1) *Rhipicephalus decoloratus*.—The blue tick is perhaps the most common South African tick and is found everywhere. It is principally found on the larger domestic animals, more rarely on sheep and goats. It is met with under various climatical and tellurical conditions. Certainly it is less frequent on the high veldt than in the middle veldt and low veldt. It is a very small tick, nevertheless the female may reach a good size when engorged, and has then a rather bluish colour, hence the name blue tick. The female begins to lay eggs usually five days after she has left the host; this applies only to the summer season, in the winter time several weeks may elapse. The eggs hatch in the warmer season, usually after three to six weeks, and on an average after thirty-six days. In the winter-time many weeks may pass. The young larvæ are endowed with longevity, which is a quality common to all species of ticks. They may live in the bottle and glass vessels for many months. They show much activity as soon as they are disturbed, probably because they hope to find a host. Once on the host they begin to feed, and after about seven days the first moulting process takes place. Now appears the nymph, which settles close to the same place and begins to suck blood. After a lapse of time, which averages about seven days, the second moulting process takes place and the sexual tick appears. A few days later copulation takes place and the female begins to engorge rapidly. She soon drops. Thus the life-cycle of the blue tick on a host is finished in about three weeks, and the complete life-history requires, under the most favourable conditions, little more than two months.

(2) *Rhipicephalus evertsi*.—The replete female is bigger than that of the former species and naturally lays a larger number of eggs, the reddish colour of which is peculiar to this tick. The hatching period of these eggs lasts, in summer, about thirty-one days. The young larvæ creep into the inner ear of their host, where they undergo their first moult. The nymph remains there until repletion, and then drops, sometimes as early as the tenth day, but usually, however, after sixteen days. The second moulting process takes place on the ground, generally after an average period of twenty-four days. The adult ticks select principally the hairless parts of the host, around the anus and the vulva. Thus the whole life-cycle of this tick lasts, under the most favourable conditions,

about ten weeks. The red tick is found on almost all domesticated animals, but rarely on the dog. It is distributed over all South Africa and is also found in high altitudes.

(3) *Hyalomma ægyptium*, the Bont leg tick.--This tick may be considered to be the largest of South Africa. The engorged female reaches an enormous size. The number of eggs she lays is calculated to amount to from 15,000 to 20,000. The hatching period averages thirty-two days. Until recently the complete life-cycle of this tick was not known. The larvæ would not feed on any mammalia. Finally, Mr. Loundsbury succeeded in feeding the larvæ on fowls, on which they also undergo their first moult, and drop as replete nymphæ after about ten days. I have repeated the experiment with a similar result. The second moulting process takes place on the ground. The adult Bont leg ticks are, with the exception perhaps of the dog, found on almost all domesticated mammaliæ. The peculiarity of this tick lies in the changing of the species of the host during the intermediate stages, that is, from a mammal to a bird. This tick is also a very common South African parasite, and is found under the same conditions as the red tick, and often in company with it. It merits close attention, since it very often causes a festering wound on the spot of attachment, and even large pieces of skin may become necrotic and drop out.

(4) *Rhipicephalus appendiculatus*.—The brown tick is about the same size as the red one. Sometimes brown males, which vary in size, are present on a host, and some have a caudal appendix, which is missing in others. Thus the idea arose that we had to do with more than one species. From observations on adult males which have moulted in the laboratory it was seen that they shed their nymphal skin without a visible tail, which, however, developed a few days after the tick had a feed. The sexes mate usually from the third day after they are placed on a host, and the female repletes herself rapidly and may drop engorged from the fourth day. Laying eggs usually begins after six days. The hatching period averages, in the warm season, twenty-eight days. The shortest period in my records is thirteen days. In the winter-time the hatching takes several months. The eggs seem to suffer greatly from cold, and the rearing of young larvæ has often proved a failure during that time. The young larvæ readily attach themselves to cattle. They also engorge rapidly and leave the host in as brief a time as three days. They have a rather bluish colour after feeding on blood, but are red and even white when they derive their nourishment from an œdematous ear. In summer-time the first

moult takes place after an average period of twenty-one days; the shortest recorded period was sixteen days. The casting of the nymphal skin is preceded by a discolouration, which begins at the head and gradually reaches the opposite end. Finally the capsule becomes white, breaks on both lateral margins, and a colourless nymphæ creeps out. After a few days this nymphæ acquires its normal colour, becoming strong and active. These nymphæ may live in covered vessels over three months. Loundsbury records an instance where they lived up to seven months. Shortly after moulting these creatures do not seem to be very hungry and do not bite readily; a few weeks later, however, they eagerly seek attachment when placed on cattle. Three days later some of them are already found replete and then drop. The outward changes of the moulting process of the nymphæ are the same as observed in the larva. The adult ticks appear in summer-time after an average period of eighteen days. They are like the larvæ and nymphæ, almost colourless, and very weak. A few days later, however, they have taken on their characteristic colour and are also much more vigorous. The adult brown ticks live in the bottle up to three months, and it is probable under natural conditions a much longer period. Once they are hungry they bite readily, and soon begin to mate as already mentioned. The length of the whole life-cycle of this tick lasts seventy-three days under the most favourable conditions. Under unfavourable conditions this time may last over six months. The *Rhipicephalus appendiculatus* is principally a summer tick, during which time it is found on various domesticated animals, chiefly in the ear, or scattered all over the body. They usually prefer the hairy margin of the ear, where they are met with in scores. Larvæ and nymphæ are met with over the whole surface of the body, principally, however, on the legs. The brown tick prefers as its habitation warm stretches of the country; it is abundant in the low veldt, less frequent in the middle veldt, and is very rare, often entirely absent, on the high veldt, where, on account of the cold winters, it cannot live.

(5) *Rhipicephalus simul*.—This tick is similar in size to the last one. The life-cycle is the same. The hatching period of the eggs averages thirty days. The first moult usually takes place after twenty days, and the second moult after twenty-five days. Adult black-pitted ticks are found on all domesticated animals. The dog seems to be a favourite host. I have observed that larvæ and nymphæ do not readily bite on oxen. It is quite probable that under natural conditions larvæ and nymphæ select other animals

than cattle as their hosts. This tick is likewise principally found in the warmer parts of the country. It is not found on the high veldt.

(6) *Amblyomma hebraeum*.—The Bont tick attains the same size as the Bont leg tick. The engorged female is sometimes even larger, and may weigh four grammes. This tick takes a long time for its complete evolution. The female begins the laying of eggs in summer-time about a fortnight after dropping, but three months may pass in winter-time. The shortest hatching period lasts about ten weeks, sometimes as many months, for it averages from four to six months. The young larvæ when hungry bite readily and replete themselves in from four to five days. The majority drop between the fifth and seventh day. The first moulting takes place after one month, but sometimes three months may pass. The nymphæ repletes itself on a new host in from three to four days. The last moulting takes place in about three weeks. The adult ticks mate in about five days after they get on a host. The females drop about seven days after copulation, having engorged enormously. The males may remain many months on the same host: this is not a peculiarity of the Bont tick, the males of almost every species may do so. Once they are removed, however, from the host they soon die. This tick also produces festering sores, especially on the udders of heifers, and may even cause the constriction and sloughing off of teats. The whole life-cycle of this tick is, under favourable conditions, about nine months; under adverse conditions over a year is required, or perhaps even two. The Bont tick is an inhabitant of the low bush veldt; it does not appear in the middle veldt. The principal hosts of this species are the ruminants, on which all life-stages are met with. The adults attach themselves on the ventral parts of the body and on the legs. They select such places by preference where the skin is soft, as under the elbows and behind the hind legs, on the groins and on the udder. Larvæ and nymphæ are frequently found on goats and sheep.

III.

The knowledge of the life-cycle of a tick indicates the direction in which experiments must be pursued in order to ascertain whether such ticks act as transmitters of the disease.

(1) The transmission is effected by means of young larvæ, whose mothers have been sucking on sick animals. This is probable for all species. The *Piroplasma bigeminum* of Texas fever, as Smith and Killbourne have shown, is transmitted in this way by

Boophilus bovis (*Rhipicephalus annulatus*), a tick closely allied to our South African blue tick. Koch has demonstrated the same mode of transmission in redwater in German East Africa. Lately Kössel, Schütz, Weber and Miessner have produced the hæmoglobinuria of cattle, that is, in redwater, in Germany by the progeny of *Ixodes reduvius*. In these instances the infection is transmitted through the egg.

(2) The infection does not go through the egg. It is contracted either in the larval state and transmitted as nymph or adult, or it is acquired in nymphal stage and communicated in the adult stage. The life-cycle of the blue tick excludes such a possibility. The Bont leg tick has also to be excluded, since its intermediate stages live on the bird. The red tick might act as a transmitter, since it passes the larval stage on an ox and leaves the host as a nymph. It might communicate the disease as an adult. The other three species, the brown, the black-pitted and the Bont tick, must be chiefly considered. Indeed, it is a well-established fact that heart-water in sheep, goats and cattle is transmitted by the nymphal and adult Bont ticks, which have been feeding on sick animals as larvæ and nymphæ. Lounsbury, to whom the observation is due, has also shown that the adult tick occasionally transmits the disease, when it has passed its second feeding stage on another non-susceptible host, after it has infected itself as larva on a sick animal.

(3) The transmission is effected by the adult tick which acquired the infection in its previous sexual form, the infection having passed from the mother tick into the eggs, remaining latent in the larva, in the nymph, and appearing in the adult. Such at least takes place in the case of biliary fever of the dog, as Lounsbury has shown. *Hæmophysalis leachi* (Audouin), the South African dog tick, leaves the host as larva and nymph, and produces the fever only after it has obtained its sexual stage. None of the intermediate stages have a pathogenic effect.

(4) *Direct Transmission*.—It is a popular opinion that the ticks in their adult stages crawl from one animal to the other. This is possible, but it is not general; and it needs a very intimate contact, as, for instance, when one animal rubs the ticks against another one. It is also generally believed that adult ticks, after they drop off, seek another host, and especially those ticks which leave a dead animal. Brown ticks do, indeed, leave the dead host. When such ticks, more often males, but also females which have not started repleting themselves, are placed on fresh cattle most of them will bite. The same ticks, when kept a few days without feeding, will soon die,

whereas the brown adult tick which emerges from its nymphal skin lives for many months. We may safely suppose that under natural conditions only a few of the adult ticks will reach a new host after they have left a dead animal.

A direct transmission of a disease has been observed to take place in the Brazilian fowl spirillosis. Marchoux and Salimbeni have demonstrated that an argas (fowl tick) feeding on sick birds will communicate the disease to healthy birds. Fowl spirillosis is, however, an inoculable malady; and argas is a tick, which leaves the host after feeding to return again. Thus a direct transmission is possible. Our ticks, however, leave their host solely to undergo further development before they seek a new host. In addition to this, East Coast fever is not an inoculable disease, and a direct mechanical transmission, which would amount to nothing else but an ordinary inoculation, is impossible. Nevertheless, some development might be expected to take place in the body of the adult tick in like manner to the plasmodium of malarial fever in the body of a mosquito.

IV.

With the exception of *Amblyomma hebraeum*, my own experiments were made with the above-mentioned ticks and in the different stages of their life-cycle. For this purpose adult ticks, larvæ and nymphæ were placed on the ears of experimental animals, where, as a rule, they bite readily. A bag was then placed on the ears of the animals in order to collect the engorged ticks. The replete ticks were placed in Petri dishes and were kept there to undergo their moulting process. The necessary moisture was applied by means of blotting paper placed under the cover of the Petri dish, which was wetted periodically. The ticks may be equally well fed on the leg of a quiet ox, and in order to collect them a kind of stocking was drawn over the leg. The blue tick larvæ were simply scattered over the skin. They attach themselves readily after they have been confined for some time. As a rule it is advisable to starve the ticks for a short period before placing them on the animals, as they will bite the more readily when hungry. The engorged females were collected by simply picking them off the animals, or by placing a cap over the ears, into which they dropped. This is decidedly the best way to collect brown ticks and red nymphæ. A number of animals were exposed to infection in Nelspruit, a country very badly infected with ticks and East Coast fever. The temperature of the exposed animals was taken daily,

and as soon as a reaction set in and the parasites were in sufficient quantities in the blood, the caps were put over the ears and a daily collection of engorged ticks was made. In addition to this, all these ticks were bred in the laboratory and were fed on healthy and sick animals. It was in this way that we were able to study the life-cycle of the different species. The skins of dead animals were carefully searched and everything was collected. In this way we noted more especially the engorged intermediate stages of the brown tick. The details of the experiments will be given in the next paragraphs. It is impossible to give an enumeration of all the experiments in chronological order, inasmuch as the collection and feeding of the ticks depended very much upon what opportunity offered and the season which prevailed.

V.

EXPERIMENTS WITH LARVÆ, THE PROGENY OF TICKS WHICH WERE COLLECTED FROM SICK CATTLE.

Rhipicephalus decoloratus.

(1) Ox 212.—On January 13th, 1904, this animal was infested with several thousand larvæ whose mothers were collected on November 5th, 1903, from cattle exposed at Nelspruit. The larvæ had hatched after January 1st, 1904. The cattle at Nelspruit were at the time of the collection of the ticks suffering from East Coast fever. A second lot of the same brood of larvæ was placed on this ox on January 21st, 1904. The engorged females dropped from Ox 212 after February 6th, 1904, and were collected in large numbers. This animal remained healthy.

(2) Ox 218.—On January 14th, 1904, this animal was infested with numerous larvæ, the progeny of blue mother ticks collected on December 22nd, 1903, from three Nelspruit cattle, Nos. 5, 11 and 21, which were suffering on this date from East Coast fever. The larvæ began to hatch on January 4th, 1904. Engorged females dropped from Ox 218 on February 6th, 1904, in large numbers. This animal remained healthy.

(3) Ox 221.—On January 15th, 1904, this animal was infested with numerous larvæ, the progeny of blue ticks collected on November 16th, 1903, from the Nelspruit heifer No. 16, which died on that date from East Coast fever. A second lot of the same brood of larvæ was placed on Ox 221 on January 21st, 1904. The engorged females dropped from the ox after February 7th, 1904. This animal remained healthy.

(4) Ox 222.—On January 16th, 1904, this animal was infested with several thousand larvæ collected from November 15th to November 17th, 1903, from the Nelspruit cattle, Nos. 13, 14 and 15, which were suffering on these dates from East Coast fever. The engorged females dropped from Ox 222 after February 8th, 1904. This animal remained healthy.

(5) Ox 168.—On January 21st, 1904, this animal was infested with larvæ, the progeny of blue ticks collected from Nelspruit animal No. 11 during the last four days of its illness, viz., from November 24th to the

28th, 1903. These larvæ hatched from January 7th to the 11th, 1904. The engorged females began to drop from Ox 168 after February 17th, 1904. This animal remained healthy.

(6) Ox 191.—On November 13th, 1903, this animal was infested with larvæ, the progeny of ticks all collected from cattle at that time sick or dead at Nelspruit. This animal remained healthy.

Rhipicephalus evertsi.

(1) Ox 194.—On November 23rd, 1903, this animal was infested with numerous larvæ of the red tick whose mothers were collected from an Indian ox which died at Nelspruit from East Coast fever. (Ox 194 died on December 16th, 1903, from pleuro-pneumonia.)

(2) Ox 232.—On February 8th, 1904, this animal was infested with red larvæ whose mothers were taken from the Nelspruit animal No. 36 on December 15th, 1903, which was at that date suffering from East Coast fever, and from Nelspruit animal No. 8, which died on that date. The eggs began to hatch on February 5th, 1904. This animal remained healthy.

Rhipicephalus appendiculatus.

(1) Ox 168.—On March 11th, 1904, this animal was infested with brown larvæ, the progeny of females collected on January 18th, 1904, from Nelspruit cattle Nos. 29 and 31, being at that date at the end of their reaction. On March 14th, 1904, Ox 168 was reinfested with the larvæ whose mothers were taken from Nelspruit animal No. 39, which was suffering from East Coast fever on January 20th, 1904. These larvæ began to hatch on March 7th, 1904. This animal remained healthy.

(2) Ox 226.—On March 11th, 1904, this animal was infested with the larval brood of some females collected on January 14th, 1904, from the sick animals Nos. 29 and 31, and from the dead animal No. 32. The engorged nymphæ began to drop from Ox 226 on March 13th, 1904. This animal was reinfested on March 11th, 1904, with large numbers of larvæ whose mothers were collected on January 19th, 1904, in Nelspruit, from animal No. 37 the day after death; from animal No. 39, then being in the middle of the disease, and from animal No. 45, then at the beginning of the disease. The larvæ began to hatch on March 3rd, 1904. The engorged larvæ began to drop from Ox 226 on March 16, 1904. This animal remained healthy.

(3) Ox 709.—On March 14th, 1904, this animal was infested with the larval progeny of the brown female tick collected from the Nelspruit animal No. 39 on the day of its death, and of all the other animals which were sick at that time. The engorged larvæ began to drop from Ox 709 on March 19th, 1904. This animal remained healthy.

(4) Ox 184.—On November 23rd, 1903, this animal was infested with the larval brood of a collection of females which were taken from dead cattle of a fresh spontaneous outbreak. The microscopic diagnosis proved the presence of East Coast fever. The larvæ which were placed on Ox 184 were ten days old. This animal remained healthy.

Rhipicephalus simus.

(1) Ox 226.—On February 8th, 1904, this animal was infested with the progeny of black-pitted females, which were collected on November 21st,

1903, in Nelspruit, from animal No. 30, which died at that date. The larvæ began to hatch on January 20th, 1904. The engorged larvæ began to drop from animal No. 226 on February 15th, 1904. On February 15th, 1904, Ox No. 226 was reinfested with the second lot of the above-described larval brood. This animal remained healthy.

(2) Ox 262.—On March 14th, 1904, this animal was infested with the larval brood of black-pitted females collected on January 16th, 1904, from the Nelspruit animals Nos. 29 and 32, which were then about in the middle of the disease. On March 24th, 1904, Ox 262 was reinfested with the larval progeny of females taken from the Nelspruit animal No. 29 on January 22nd, 1904, that is, two days before death; and from animal No. 22, which was then at the beginning of the disease. The engorged larvæ began to drop from Ox 262 on March 30th, 1904. This animal remained healthy.

Result.—All experiments had negative results. We are therefore entitled to conclude that tropical piroplasmosis is not transmitted by larvæ whose mothers have been sucking blood from sick cattle.

VI.

EXPERIMENTS TO SEE WHETHER NYMPHÆ WHICH HAVE BEEN FEEDING AS LARVÆ ON SICK CATTLE WILL TRANSMIT THE DISEASE.

Rhipicephalus appendiculatus.

(1) Ox 203.—On June 3rd, 1903, this animal was infested with a small number of brown nymphæ which had been feeding as larvæ on the sick Nelspruit calf No. 164. The engorged nymphæ were collected on Ox 203 on June 11th, 1903. The mothers of these nymphæ were taken from an immune ox which in August, 1902, had recovered from East Coast fever. The larvæ had been feeding on Calf 164 from April 29th, 1903, and from May 1st, 1903, up to May 5th, 1903, on which date Calf 164 died from East Coast fever. Ox 203 remained healthy.

(2) Ox 184.—On June 8th, 1903, this animal was infested with a second lot of the above nymphæ which had been feeding on the sick Calf 164. The moulting had only taken place a few days previously. The engorged nymphæ dropped off Ox 184 from June 11th, 1903. This animal remained healthy.

(3) Ox 188.—On June 9th, 1903, this animal was infested with about fifty nymphæ of the above brood, which, as larvæ, had been feeding on the sick Calf 164. These nymphæ moulted on June 7th, 1903. The engorged nymphæ began to drop off Ox 188 on June 16th, 1903. This animal came into reaction on June 22nd, 1903. The typical piroplasma of East Coast fever was present. The animal died on July 5th, 1903. The incubation period lasted twelve days, the disease fourteen days.

Post mortem.—Rigor mortis present, condition poor. The beef was pale; the blood was not completely coagulated. There was some liquid in the pericardial cavity. The liver was dotted with white and red infarcts. The gall-bladder was small and contained yellow bile. The spleen was normal. The kidneys were pale, dotted with numerous small

white infarcts and a few red ones. The urine was red. The mucous membrane of the fourth stomach was slightly reddened and very much swollen, and so was also the mucosa of the small intestines, which was dotted with numerous hæmorrhages. In the colon were a few congested patches; the lungs were slightly œdematous. The endocardium of the left ventricle was dotted with hæmorrhages.

(4) Ox 207.—On June 30th, 1903, this animal was infested with twenty-five nymphæ of the above brood which had been feeding as larvæ on Calf 164. The engorged nymphæ dropped from Ox 207 from July 10th until the 24th, 1903. This animal remained healthy.

(5) Ox 184.—On December 22nd, 1903, this animal was infested with numerous nymphæ which had been feeding as larvæ on the Nelspruit Calves 5 and 6. Calf 5 was sick from November 7th, 1903, and died on November 29th, 1903. Calf 6 was sick from November 15th, 1903, and died on November 29th, 1903. The larvæ were feeding on this calf from November 23rd, 1903, until November 27th, 1903. The mothers of these larvæ originated from healthy animals and were bred in the laboratory through one generation. Calf 184 sickened on January 5th, 1904, and died on January 18th, 1904. The period of incubation lasted twelve days, and the disease thirteen days. The piroplasma of the East Coast fever appeared on January 8th, 1904, and increased daily until death.

Post mortem made about half an hour after death. There was no rigor mortis. The animal was in good condition; the blood was not yet coagulated. The lungs were slightly œdematous. The mediastinum was infiltrated with yellow liquid; there was also liquid in the pericardium. The heart was flabby; the ventricles contained a well-coagulated clot. The liver was enlarged, jaundiced and hard, dotted with numerous spots of a whitish-yellow colour. The spleen was normal. The kidneys were strongly congested; there were a few white infarcts present. The urine had a brown colour. The fourth stomach was very much swollen and intensely reddened and thickened, and there were numerous patches with strong congestions.

Result.—Out of five animals which were infested with nymphæ after feeding as larvæ on sick cattle, two contracted East Coast fever and died.

Rhipicephalus simus.

Ox 114.—On February 8th, 1904, this animal was infested with numerous black-pitted nymphæ which had been feeding as larvæ on Ox 184, and which were collected two days previous to its death. The mother ticks of these larvæ were collected on November 18th, 1903, from a dog in Nelspruit. The eggs were hatching from February 1st, 1904. The engorged nymphæ dropped from Ox 114 on February 13th, 1904. Ox 114 began to sicken on February 26th, 1904, after an incubation period of seventeen days. Death ensued on March 8th, 1904, after an illness of twelve days. The piroplasma of East Coast fever was first noticed on February 29th, 1904; it increased daily, and on death averaged about 50 per cent. of all red corpuscles.

Post mortem was made shortly after death. The cadaver was in a rather poor condition; rigor mortis was not yet present, and the blood

not yet coagulated. The various serous membranes were slightly jaundiced. There was some liquid in the heart-bag; the heart was otherwise normal. The lungs were also normal. The liver was enlarged; it had on section a granular appearance. The gall-bladder was contracted and contained thick yellow bile. The kidneys were dotted with red infarcts. The urine was normal. The mucosa of the fourth stomach was pale and dotted with several hæmorrhages. The mucous membrane of the small intestines was uniformly thickened and bile-stained. The mucous membrane of the large intestines was also swollen.

Result.—The only animal which was infested with pathogenic black-pitted nymphæ, contracted East Coast fever and died.

VII.

EXPERIMENTS TO SEE WHETHER ADULT TICKS WHICH HAVE BEEN FEEDING AS NYMPHÆ ON SICK CATTLE WILL TRANSMIT THE DISEASE.

Rhipicephalus decoloratus.

I have already stated that the blue tick undergoes its life-cycle on the same host. It would not, therefore, under natural conditions, be able to transmit the disease in the way indicated in the above heading. With a little care the engorged nymphæ can easily be collected and will then moult in the vessel. One experiment was made with Ox 191, which was infested with adult blue ticks on November 30th, 1903. These adults were collected as nymphæ from the Nelspruit animals Nos. 3, 4, 7, 12 and 17, during the time they were suffering from East Coast fever. The adult ticks bit readily on Ox 191. They mated, and the engorged females were collected. This animal remained healthy.

Rhipicephalus evertsi.

This tick seeks its host in the larval form and leaves it as an engorged nymphæ.

Ox 191.—This animal was infested with large numbers of adult red ticks which were collected as nymphæ from sick animals. On February 2nd, 1904, it was infested with adults collected in Nelspruit from animal No. 25, during the time when numerous piroplasmata were present in the sick beast. The engorged red females began to drop off from Ox 191 on February 10th, 1904, and on the same day it was reinfested with red males and females taken as nymphæ from the Nelspruit animals Nos. 29 and 31 in the first stage of the disease, and from Nelspruit animal No. 32, which died on that date (January 12th, 1904). On February 15th, 1904, it was reinfested with numerous red ticks taken, on January 18th, 1904, from the following sick Nelspruit animals Nos. 29, 31 and 39. On February 23rd, 1904, it was reinfested with numerous adult red ticks taken, on January 23rd, 1904, from the following sick Nelspruit cattle, Nos. 39, 42, 43 and 46. The nymphæ began to moult on February 16th, 1904. On February 24th, 1904, the ox was reinfested with adult red ticks of the above brood. Further infestations were made with the same brood of ticks on February 26th, 27th and 28th, 1904, and on March 4th, 1904. This animal remained healthy.

Result.—The repeated strong infestations with red ticks, which originated as nymphæ from sick animals, had negative results.

Rhipicephalus appendiculatus.

(1) Ox 380.—On October 24th, 1903, this animal was infected with three adult brown ticks, which were taken as nymphæ from a dead Nelspruit animal. The nymphæ passed the moulting stage in the laboratory. The adult ticks which were placed on Ox 380 did not bite readily, and were found moving about for several days. Ox 380 died on December 7th, 1903, from East Coast fever.

Post mortem was made one hour after death. Rigor mortis was not yet present. The cadaver was in a poor condition. The blood was not completely coagulated. There was an anæmic condition of the whole body. The lungs were slightly œdematous; there were petechiæ on the heart; there were old fibrous lesions on the pleura. The liver was dotted with white spots; the bile resembled chewed grass. The spleen was enlarged; the kidneys contained several large white infarcts. The piroplasma of East Coast fever was present in great numbers.

(2) Ox 35.—On December 19th, 1903, this animal was infested with adult brown ticks, male and female, which were collected as nymphæ from an animal which died in Nelspruit from East Coast fever. The moulting had taken place in the laboratory. The engorged females began to drop off Ox 35 on December 23rd, 1903. The animal began to sicken on January 3rd, 1904, after an incubation time of fourteen days, and it died on January 13th, 1904, or after a disease lasting eleven days.

Post mortem was made early on the morning of January 14th, 1904. Rigor mortis was present. There was a slight jaundiced condition of all organs, and an œdematous condition of the lungs. The heart was flabby. The blood was not completely coagulated. The liver was very strongly jaundiced and hard; the gall-bladder was very small and contained a viscid bile. The spleen was normal, and the kidneys had a normal colour and were studded with numerous white infarcts of various size. The urine bladder was filled with a brown urine. There were gelatinous infiltrations of the intermuscular tissue. The mucous membrane of the fourth stomach was pale; there were small hæmorrhagic spots present, which attained about the size of a threepenny piece. The intestines were slightly swollen.

(3) Ox 207.—On December 23rd, 1903, this animal was infested with six adult brown ticks, male and female, taken from an animal which had died from East Coast fever in Nelspruit. The animal began to sicken on January 1st, 1904, that is, after an incubation period of eight days, and it died on January 16th, 1904, or after an illness of fifteen days. The piroplasmata were found the first time on January 13th, 1904, and were present on the last day, infesting about 50 per cent. of corpuscles.

Post mortem was made soon after death. The cadaver was in a fair condition; there was a discharge of mucus foam from the nose and mouth. The beef was somewhat pale, and the fat was slightly yellow and of a gelatinous character. There were about 400 c.c. of yellow liquid in the pleural cavity. The lungs were very œdematous, with numerous hæmorrhagic infarcts. In the heart-bag were about 20 c.c. of yellow liquid; the endocardium of the left ventricle contained pronounced hæmorrhagic infiltrations;

there was a gelatinous infiltration at the base of the heart and in the mediastinum. The liver had, on section, a glossy appearance; the bile was thick and of a brown colour. The spleen was normal. The kidneys were embedded in tissue which was infiltrated with liquid; only one infarct was found in the kidneys. The urine was clear. The mucous membrane of the fourth stomach was slightly reddened, and there were several hæmorrhagic ulcers, attaining the size of a threepenny piece. The mucous membrane of the duodenum showed red patches and was swollen. There were also a few hæmorrhagic ulcers in the small intestines about as big as a pea; the mucous membrane was swollen throughout the whole length of the intestines and there were hæmorrhagic patches in the colon and the cæcum; some of the patches were of a slightly slate colour.

(4) Ox 190.—On December 15th, 1903, this animal was infested with five female and three male adult brown ticks which were taken as nymphæ from cattle which had died at Nelspruit. The animal began to sicken on December 29th, 1903, that is, after an incubation period of thirteen days, and it died on January 11th, 1904, of East Coast fever, after an illness of fourteen days.

Post mortem was made directly after death. Rigor mortis was not yet present. The blood was not coagulated. Condition fair; the beef was pale. There was some liquid in the pleural cavity; there were some petechiæ on the base of the heart-bag which contained a little liquid; the epicardium was spotted with hæmorrhages, which were also present in both ventricles. The lungs were œdematous; there were red infarcts under the pleura about the size of a pea. The liver was jaundiced; the gall-bladder was thickened and contained brown bile. The spleen was normal. There were a few white infarcts in the kidneys. The urine was normal. The fourth stomach was very much reddened and there were numerous small hæmorrhages on the surface of the mucosa. There were red streaks and patches in the duodenum, the colon and the cæcum. About 60 per cent. of all red corpuscles were infested with the piroplasmata of East Coast fever.

(5) Ox 224.—On February 8th, 1904, this animal was infested with one male and one female brown tick which had been feeding as nymphæ on Calf 190 during the time it was suffering from East Coast fever. These nymphæ moulted on January 25th, 1904. The larvæ came from mother ticks taken from a healthy ox; they had been feeding on a healthy ox. Ox 224 began to sicken on February 19th, 1904, that is, after an incubation time of ten days, and it died on March 2nd, 1904, the disease lasting thirteen days.

Post mortem was made two hours after death. The condition of the cadaver was poor. The rigor mortis not yet complete. The beef was rather pale. There were red infarcts in the lungs of various size. There were a few hæmorrhagic spots on the epicardium and also a few in the left ventricle. The liver was hard and jaundiced; the gall-bladder was thickened and contained yellow liquid bile. The spleen was normal. There were a few infarcts in the kidneys. The urine was normal. The mucous membrane of the fourth stomach was very much swollen and uniformly reddened. The mucous membrane of the small intestines was also swollen. That of the colon was swollen and slate-coloured, and a few ulcers were present, varying in size from a threepenny piece to a

penny, and covered with necrotic matter. There were a few red patches in the rectum. The piroplasmata were fairly numerous on the date of its death.

On February 23rd, 1904, this animal and the following one served as an ocular demonstration to convince some non-believers that East Coast fever was carried by ticks. They were chosen by Mr. D. G. E. Erasmus, a well-known Transvaal cattle-breeder, who carefully selected oxen which were immune to the common diseases of the country.

(6) E. 1. was infested on February 23rd, 1904, with eleven female and male brown ticks of the same brood which had been feeding on Ox 190 during its illness. The animal began to sicken on March 5th, 1904, that is, after an incubation period of ten days. It died on March 17th, 1904, that is, after an illness of twelve days.

The *post mortem* was made some hours after death. There were several large spots infiltrated with jelly-like matter in the region of the shoulder, the abdomen and the groin. There were hæmorrhagic infarcts in the lungs, which also showed a fibrous patch on the pleura. The liver was enlarged and dotted with numerous small white spots. The bile was thick and viscid. The kidneys were also spotted with numerous white infarcts. The fourth stomach and all the intestines were in a state of acute gastritis and enteritis. The urine was brown in colour.

(7) E. 2 was infested on February 23rd, 1904, with nine females and males of the same brood of ticks which had been feeding as nymphæ on Ox 190. This ox also began to react on March 5th, 1904, after an incubation period of ten days, and it was killed on March 22nd, 1904, being then in a state of collapse.

Post mortem was not made by myself, but the examination of smears during the illness, and taken the day previous to death, showed the characteristic piroplasma of East Coast fever.

(8) Ox 6.—On February 15th, 1904, this animal was infested with twenty male and female ticks of the brood feeding as nymphæ on Ox 190. The history of Ox 6 has already been related. This animal, after an injection of ordinary immune redwater blood, had a reaction, during which the small piroplasmata were seen in the blood. This experiment was made to test whether these small piroplasmata were those of East Coast fever. Accordingly, if the ox now contracted East Coast fever, it would prove that the first reaction had nothing to do with the disease. Ox 6 began to sicken after an incubation period of ten days, and it died on March 7th, 1904, or after an illness of eleven days.

Post mortem was made directly after death. The cadaver was in a poor condition. The lymphatic glands of the intermaxillary space were swollen. There were signs of a yellow diarrhœa. The blood was not properly coagulated. The beef had a peculiar brown colour. There was a yellow watery infiltration of the different serous membranes. The lungs were pale, with a few red infarcts. There was much yellow liquid in the heart-bag, and there were a few petechiæ on the surface of the heart. The spleen was of normal size; its mesentery was infiltrated with copious hæmorrhages. The liver was enlarged, it was granular on section and had a glossy appearance. The bile-bladder was distended with green thick bile. The kidneys were congested and contained numerous white infarcts. The urine was normal. The mucous membrane of the fourth stomach was strongly congested. There were numerous small hæmor-

rhages on the folds of the stomach. In the fundus of the stomach were two hæmorrhagic ulcers, reaching the size of a sixpence. The mucous membrane of the whole length of the intestines was swollen, reddened and contracted into folds. The outside aspect of all the intestines had a swollen appearance. The parasites of East Coast fever were present in large numbers.

(9) Ox 200.—On February 22nd, 1904, this animal was infested with one male and one female adult brown tick of the brood which had been feeding as nymphæ on Ox 190. Both ticks bit readily. The animal remained healthy.

Result.—Out of nine oxen which were infected with pathogenic adult brown ticks eight died from East Coast fever. The experiments prove that two adults are able to produce the disease. But the experiment No. 200 proves that two ticks are not always able to produce the disease. The experiment Ox No. 224 and (6) E. 1 and (7) E. 2 proves that the adult ticks have contracted infection as nymphæ. Their mothers were taken from healthy cattle and the larvæ had also been feeding on healthy cattle.

VIII.

EXPERIMENTS WITH ADULT TICKS WHICH AS NYMPHÆ PRODUCED THE DISEASE.

(1) Ox 234.—On February 2nd, 1904, this animal was infested with seventeen male and female brown adults which as nymphæ were feeding on Ox 184, and which gave this animal the disease. The moulting into adults had taken place on January 17th, 1904. The engorged females began to drop off from Ox 234 on February 10th, 1904. This animal remained healthy.

(2) Ox 205.—On July 30th, 1903, this animal was infested with adult brown ticks which had been feeding as nymphæ on Ox 188, and so communicated East Coast fever to this animal. The nymphæ began to moult in the laboratory on June 7th and 8th, 1903. This animal remained healthy.

(3) Ox 212.—On February 24th, 1904, this animal was infested with ten adult brown ticks which had been feeding as larvæ on the sick Nelspruit animal No. 11. The nymphæ were feeding on Ox 134 during the incubation time. The last nymphæ dropped, engorged, on the same day that the fever reaction started. The engorged females began to drop from Ox 212 on February 29th, 1904. This animal remained healthy.

(4) Ox 176.—On July 27th, 1903, this animal was infested with seven adult brown ticks which had been feeding as nymphæ on Ox 188 and produced disease in this animal. The engorged females began to drop from Ox 176 on August 11th, 1903. This animal remained healthy.

Result.—Brown ticks, which as nymphæ were pathogenic, did not produce the disease as adults. The case No. 212 proves also

that a nymph sucking blood during the incubation time does not take the infection, which *à priori* had to be surmised.

IX.

EXPERIMENTS WITH ADULT TICKS WHICH WERE TAKEN FROM SICK AND DEAD CATTLE AND PLACED ON HEALTHY ONES.

Rhipicephalus evertsi.

Ox 216.—On November 19th, 1903, this animal was infested with numerous adult red ticks removed on November 18th, 1903, from the dead Nelspruit animal No. 4. This ox remained healthy.

Hyalomma aegyptium.

Ox 215.—On November 19th, 1903, this animal was infested with numerous Bont legs ticks which were removed on November 18th, 1903, from the dead Nelspruit animal No. 4. The male adults were still found on Ox 215 on December 19th, 1903, and on January 6th, 1904. This animal remained healthy.

Rhipicephalus appendiculatus.

(1) Ox 187.—On April 24th, 1903, this animal was infested with numerous adult brown ticks which had been taken from the dead Nelspruit animal No. 167 on April 24th, 1903. On May 7th, 1903, seven adult males were still found fast in the ear of Ox 187. This animal remained healthy.

(2) Ox 181.—On May 1st, 1903, this animal was infested with twenty-two brown adult ticks which were found in the ear-cap of the Nelspruit animal No. 168 after its death. On May 9th, 1903, the replete females dropped from the Ox 181. This animal remained healthy.

(3) Ox 171.—On May 6th, 1903, this animal was infested with adult brown male ticks removed from the Nelspruit animal No. 164 shortly after death. On May 7th, 1903, thirty-one adult male ticks were found attached to Ox 171. This animal remained healthy.

(4) Ox 172.—On May 6th, 1903, this animal was infested with the second lot of the adult male brown ticks removed from the Nelspruit animal No. 164. On May 7th, 1903, nineteen adults were found fast on Ox 172. This animal remained healthy.

(5) Ox 238.—On December 12th, 1903, this animal was infested with thirty-seven adult brown ticks, including two females. These ticks were removed from a dead cow in Machadodorp which, on microscopical examination of the blood, proved to have been suffering from East Coast fever. This animal remained healthy.

(6) Ox 448.—On March 13th, 1904, this animal was infested with male adult brown ticks which had produced the disease in the oxen E. 1 and E. 2. The ticks bit readily. The animal remained healthy.

(7) Ox 223.—On March 8th, 1904, this animal was infested with five male brown ticks which had produced the disease in Ox 6. The animal remained healthy.

Rhipicephalus simus.

(1) Ox 212.—On November 19th, 1903, this animal was infested with adult black-pitted ticks which were removed on November 18th, 1903, from the dead Nelspruit animal No. 4. On January 6th, 1904, the male black-pitted ticks were still found on Ox 212. This animal remained healthy.

(2) Ox 142.—On December 9th, 1903, this animal was infested with nine black-pitted adults removed from the dead Nelspruit animal No. 2 on November 29th, 1903. These ticks were still found on December 19th, 1903. This animal remained healthy.

Results.—Adult ticks which were taken from sick animals did not in any instance produce the disease.

Brown ticks which as nymphæ had produced the disease did not produce the disease in their last feeding stage, that is, as adults. This experiment appears to prove that the brown tick is able to produce the disease only once. I have, however, as yet no experiment to show whether it is the male or the female tick that after feeding as a nymphæ on sick cattle produces the disease.

Conclusions.—East Coast fever is transmitted in South Africa by *Rhipicephalus appendiculatus* (the brown tick), and by *Rhipicephalus simus* (the black-pitted tick). The former tick must be considered as the principal carrier of infection, while the adult brown tick which has been feeding on sick cattle as a nymphæ must be considered as the main intermediate host. All other ticks may be excluded. We have no experiments with *Amblyomma hebraeum*, but since it is a tick with three hosts, there is a probability that it might also act as a transmitter of the disease. Again, we may further conclude that the pathogenic tick produces the disease only once. The same tick which has once produced the disease does not remain long enough on the animal to reinfect itself again. We have to expect East Coast fever in South Africa in such regions where the intermediate hosts of the piroplasma are found, or where such ticks are present which require three hosts for the development of their life-cycle. These hosts live chiefly in the warmer parts of the Transvaal, and it is in such parts that East Coast fever has become firmly established.

TRAINING SOLDIERS IN PERSONAL HYGIENE.

BY LIEUTENANT-COLONEL H. K. ALLPORT.

Royal Army Medical Corps.

THIS is almost a new idea, but more probably an old one revived or intensified. Formerly it was not possible, now we live in more sanitary times; and the only barrier to the attainment of the idea is the ignorance of the soldier.

The "*esprit de corps*" story is not yet old, and is still applicable to men in the ranks at the present time. The soldier has never been taught the practical art of healthy living, indeed I do not know of any class to whom it is systematically taught; it is an art neglected in civil life as well as in the army. But the young soldier, of all men, requires such instruction; he has been placed without preparation in new surroundings, the purpose of his life has been changed, he is expected to become a healthy animal, fit in every way for the strain of war or foreign service. He may, and indeed must, learn something of personal hygiene, but there is no system, no teaching, and there is nobody responsible. He is encouraged to learn everything else needful for his profession, but in this matter the recruit is supposed to be inspired. Now my experience shows me that he does not know the simplest things, such as how to wash, how to care for his teeth, or his feet; how to look after his underclothing, how to eat or drink, how to avoid cold or heat, how to preserve his health and fitness under varying and unusual conditions. The young soldier is in these matters a grown up baby whose education stopped at the age of three, when he was left to look after himself.

If the soldier can be successfully trained in these matters the result will be of immense value to the State, as well as to the man himself. The writer is impressed with the necessity of training the recruit in this art, and making it a part of the routine through which he must pass. It is futile to condemn the men for their apathy and their ignorance of simple sanitary laws—they know nothing about it.

An officer of a distinguished regiment once said to me, "'tis no use, you can't clean them, 'tis their nature to be dirty, they like it. This would be a nice regiment without the men, just the band and the Mess." Well, I admit they were difficult, but that was in the old days. Still, however, it is hard to influence the men in a regiment; they are set; whatever may be the habits and traditions.

of the men, they are almost unchangeable. To be quite successful this training should be commenced in the *dépôt* and carried on in the regiment.

Who will carry out this work, what branch of the army will undertake it? There are no arrangements at present in force. I think there can be only one answer. The Officers of the Royal Army Medical Corps have the necessary training; it is their interest; it will further their work; they ought to undertake it.

The sympathy of the regimental officers should be aroused, and the co-operation of the non-commissioned officers is essential, as they are in constant touch with the men, and can get them to do things that no amount of talking will accomplish.

May I sketch very briefly my own experience among the recruits of the Royal West Kent Regiment at Maidstone. Here I found the plastic material I desired. Colonel Brock commanding the troops entered fully into the plan. The men were assembled in the gymnasium once or twice a week, and I talked to them. Practical illustrations were given when possible, and a black board was useful. They formed a very interested and attentive audience, and I learn that my lectures form texts for barrack-room conversations. The subjects and the language were simple; just their daily life and habits, about fresh air, sunlight, food and drink, their clothes, their rooms, the care of their teeth, cleanliness. Many converts were made, and a new feeling is growing. The work is also carried on at weekly inspections; this is very important, and a most practical way of impressing and teaching the men. The idea is kept before their minds on every suitable occasion, in the gymnasium, at vaccination, at hospital.

The regimental officers give their support, and the non-commissioned officers assist, they come into direct touch with the men in their rooms, and daily life. The gymnasium instructors especially, have a very powerful influence, which I am happy to say they employ for good.

For the short time that this work has been carried on the results appear most favourable, and encourage a feeling of great hopefulness. The recruits begin to understand and take a pride in following rules intelligently. I am gratified by the ready, "Yes Sir, I do so since you told us about it." Even men in the Militia get their friends in the Regulars to "put down for a tooth brush," so that they too may clean their teeth. Men buy a fourth pair of socks so that two pairs may go to the weekly wash, and two are kept in wear. Excessive cigarette smoking has diminished, spitting

(of all habits the most disgusting in soldiers and sailors), is dis-
countenanced, and has almost ceased. Altogether, there is the
commencement of a higher standard of cleanliness and comfort.

It is gratifying to know that even incomplete results can be
attained ; but the work must be continued in the regiment, or these
men will get under the influence of traditions that may not be
favourable to the new idea.

Training the soldier in this practical art of healthy living
should be commenced in the *depôt* but still carried on in the
regiment. If we (the officers of the R.A.M.C.), undertake it, it
will give us a wider interest in the soldier, a deeper interest
in our work. It will do more, it will encourage and cement a
comradeship and sympathy with the other branches of the service ;
it will get rid of that feeling that we are always fault finding ; we
will have the soldier interested in his own welfare, and the sympathy
and co-operation of the regimental officers.

It is gratifying to know that this educational effort is not an
isolated one : others have been working in the same direction, and
I feel encouraged to hope that the movement may spread widely.

SANITARY NOTES FOR RECRUITS.

BY MAJOR P. G. IEVERS.

Royal Army Medical Corps (Retired).

PART I.

Intoxicating Liquors.—The subject to which I wish to draw attention is that of the use, and also the abuse, of alcohol—by which I mean intoxicating liquors of all kinds, but more especially beer, to which the soldier is most addicted. Now inasmuch as beer contains alcohol in quantities up to 10 per cent. or more, it must be placed in the same category as spirits, although not by any means so detrimental as the latter. Still, even beer, when taken in excess, may lead to all the unhappy results caused by spirituous liquors, including rum, whiskey and gin, as the most usual varieties. The amount of alcohol contained in these averages about 50 per cent., and it is this active principle that is accountable for the poisonous effects on the system, and, furthermore, has to answer for at least half the crime and a large part of the poverty and unhappiness of the world.

Drunkenness.—We find that the effect of intemperance in any alcoholic beverage is to cause premature old age, to produce, or predispose to, numerous diseases, and to lessen the chance of living in a marked degree; for in intemperate persons the mortality from 21 to 30 years of age is five times that of the temperate; it has also been conclusively proved by the anticipations of the various Insurance Companies that the temperate and total abstainers have an immense advantage over even the moderately temperate. Further, the mortality among men in certain callings, such as inn-keepers, brewers and cab-drivers, who, as a rule, are more or less addicted to excess of alcohol, is comparatively high.

Effects of Intemperance.—The effects of alcohol, too, when taken in excess, checks digestion, inflames the mucous, or lining, membrane of the stomach, and produces chronic catarrh of that organ; it is also a common cause of liver and kidney disease, impairs the nervous system greatly, often to the extent of causing insanity, and ultimately destroys the brain power, terminating in paralysis and death. We know that the habitual use of alcohol in any form is not necessary in the animal economy, but rather is its use condemned by the highest authorities, even amongst Arctic explorers in the coldest climates; its use is equally unnecessary and, indeed, if any-

thing, more baneful in hot climates, where it has been found to interfere with acclimatisation, and predisposes to heat-stroke.

Alcohol not allowed in Training.—Trainers do not permit the use of spirits, and that alcohol does not increase muscular power is shown by the fact that men who are engaged in the most laborious pursuits, such as prize-fighters, are better without it. Coming to practical business, so far as soldiers are concerned, we find from practical experience that the greatest exertion under the most trying conditions has been performed by troops altogether deprived of intoxicating liquor of any kind.

Experience gained in Campaigns.—In the Kaffir war of 1852, for instance, 1,000 miles was covered in seventy-one days, or at the rate of fifteen miles a day. The men were almost naked; whilst exposed to excessive heat by day, the water froze in the water bottles at night in bell tents with twenty-one men sleeping in each tent. Yet the men were healthier than ever before. Similar experiences were obtained in the Red River expedition under Lord Wolseley, who substituted tea in liberal quantities instead of the spirit ration, with the best results.

Occasions in which Spirits are Admissible.—Perhaps the wisest course to take in this matter without going to extremes would be to reserve the tot of rum, or other liquor, for special occasions, when, for instance, men are called on to engage the enemy after a forced or exhausting march, or where the circumstances demand a very exceptional effort against time for the relief of a garrison or other extremity of a like nature. Even then it would be far better to serve out the spirit combined with extract of beef and hot water to half a pint for each man, which would be found more sustaining, and not likely to be followed by the depressing after-effects of spirits, pure and simple.

PART II.

Tobacco and its injurious Effects.—Adverting to the subject of tobacco, to the use and abuse of which I desire to draw serious attention, as this drug offers many important points for our consideration. Unfortunately, this is a habit that is generally—if not always—contracted in early youth, a time when anything acting prejudicially on the nervous system is particularly hurtful. At this age the bones are being knit together, and the joints are becoming settled down in maturity. More especially is the heart now called on to pump the increased flow of blood required to

keep pace with the rapid growth of the body, and it is this vital organ that first shows the detrimental effects of tobacco or cigarette smoking.

Effect of Tobacco on the Heart.—There is a disease now familiar to the medical profession known as *tobacco heart*, and yet it is the heart, the great organ of circulation, which the soldier—perhaps more than anyone else—needs to keep sound; for, from the nature of his duties, he is at times called on to perform great exertion, often under the most trying circumstances, incidental to the wear and tear of war. Yet there can be no doubt whatever that tobacco-smoking acts as a poison to the heart, depressing and interfering with the regularity of its action, and causing in many cases palpitation, sufficient to cripple or render useless for soldiering the man who becomes its slave. Again, the continuous use of tobacco in excess may, and often does, produce blindness (*amaurosis*). I write on this subject from practical experience, having frequently to reject recruits owing to this cause alone.

Experience of Recruiting in England.—Indeed, the practice of cigarette or “fag” smoking is becoming so common amongst recruits of a certain class—especially those raised in the towns—that it is rare to find them without having their fingers stained from the drug, which only too often tells its own tale. On referring to the recruiting returns of the Manchester district, for example, for the year 1901, we find that out of 11,896 who presented themselves only 3,076 were accepted (about one-fourth); whilst the Recruiting Officers declare that one of the chief causes of this rejection is the widespread habit of cigarette-smoking. “They come to us,” they say, “with their fingers stained with cigarettes, and nearly all of them suffering more or less from palpitation or disordered action of the heart.” This question then becomes a serious one for the State; and unless something be done soon to put a stop to this pernicious habit, the rising generation and those following will become sadly degenerated.

Experience of Recruiting in America.—Further, it is also stated that upwards of 90 per cent. of cigarette smokers, who offered themselves for the army in America during the last war, were rejected on account of some physical disability. In like manner I could easily prove the baneful effects of this obnoxious habit from a mental point of view.

Mental Effects in French Schools.—Some time ago it was found that 102 of the pupils in the Polytechnic School in Paris smoked, and 58 did not. Yet, out of the 20 who stood highest in the

examinations there were only 6 smokers. These are facts worth considering. At the same time I am well aware of the futility in endeavouring to bring the evil effects of tobacco home to old soldiers, as this unfortunately is a habit acquired in youth, and, if once established, is all but certain to continue to old age. It is, therefore, to recruits especially I wish to direct these remarks, in the hope that, before it is too late, they may realise the damage and injury to health occasioned by this vicious habit ; and I desire to assure them that they will in every respect be not only healthier men, but better soldiers without it.

REMARKS UPON SOME CASES OF APPENDICITIS AND OTHER FORMS OF PERITONITIS.

BY CAPTAIN J. T. CLAPHAM.
Royal Army Medical Corps (Half-Pay).

DURING the past year I have had the opportunity, by the kindness of Mr. Bowlby, of observing the progress of many cases of appendicitis and the like in his wards at St. Bartholomew's Hospital. From my notes on these I propose to choose instances which illustrate important points in these affections.

It was in my student days that Fitz, of Boston, gave, in 1886, the first precise account of a disease which he called appendicitis. It is true that Addison, in 1836, had drawn special attention to the diseased condition of the appendix found in cases of inflammation in its immediate neighbourhood, a condition to which Dupuytren gave the name of a "phlegmon of the right iliac fossa." But the power of the peritoneum to rapidly isolate inflammatory effusion was not then understood, and abscesses localised in that region were supposed to occupy the connective tissue. I confess I have no recollection of Fitz's monograph which first put the disease on its proper footing; but I remember a case labelled by the new name, as I do others of its forerunner, typhlitis, and also of peritonitis pure and simple, more common then than now. Still, I doubt if these latter were as frequent as is now often stated to have been the case, or if errors of diagnosis by our predecessors account altogether for the apparent increase in appendicitis to-day. Indeed, it is a vexed question whether this greater prevalence is real or not. Sir Frederick Treves, in his Cavendish Lecture on the subject says: "Nor is there any evidence to support the suggestion that it (appendicitis) has undergone any remarkable recrudescence, or that it has become more frequent in its appearance. It passed unrecognised in earlier times as gastric attack or gastric seizure, perityphlitis, cramp of the bowels, inflammation of the intestines, iliac phlegmon, and the like. It was the *fons et origo* of many forms of peritonitis."

On the other hand, I have heard well-known surgeons say that they have little doubt that, of late years, there has been a real increase in the prevalence of the disease, though they cannot account for it. Less responsible writers from time to time announce causes varying from cigarette smoking to the con-

sumption of refrigerated meat, from the effects of influenza to the use of badly enamelled cooking pots. Here, again, the hurry of modern life, bolted food, and constipation, are made to answer for it. But is the rush of existence so markedly greater than it was a dozen or fifteen years ago? Or is the athletic damsel of to-day more prone to constipation than was her sedentary grandmother in the "forties"?

It is a truism that the type of a disease varies from time to time, possibly owing to modifications in bacteria and their products, as well as to the environment of their hosts. When one considers what is the most constant factor in appendicitis and other peritoneal infections, is it not the presence of the *Bacillus coli communis*? In the Hunterian Lectures of last year, Mr. Eccles analysed the results of the bacteriological investigations of many authorities as to the pathogenic organisms present, in such cases, in the lumen of the appendix, its walls and its surroundings. He finds that in 94 per cent. of cases it is the colon bacillus. Far behind follows that of tubercle in 2 per cent.; whilst streptococcus and staphylococcus are bracketed third in frequency, with a percentage of 1·5 each. May not the virulence of the former organism be enhanced nowadays by conditions of which we are ignorant; and is it unreasonable to look in this direction for some explanation of the apparent increase of this disease?

As appendicitis is now to the fore, so the mere existence of what was called typhlitis has been denied. That perforation of the cæcal wall and perityphlitis not primarily due to the appendix still account for a small percentage of cases of peritonitis in the right iliac fossa has been shown by Dr. Russell, of Edinburgh. From what he describes as a comparatively small experience he gives four instances.¹ Three were of acute perityphlitis due to primary lesion in the cæcum. Of these, one case on operation showed marked pericæcal inflammation, while the appendix showed none; at the autopsy a few days later fæcal ulcers were found in the cæcum. The perforation of a similar ulcer was the cause of death in a second. In a third fatal case there was no perforation or ulcer. In none of these was the appendix diseased. In the fourth a burrowing perityphlitic abscess was found, in which the appendix was not involved. Whilst considering that a margin should be left for such cases, he is of opinion that in more than 95 per cent. of acute affections at the cæcum the primary seat of trouble is the

¹ *Lancet*, March 9th, 1904.

appendix, and that were it not for this vulnerable relic perityphlitis would be of rare occurrence.

Again, has not the appendix been credited nowadays with a little more than its due share in the causation of that form of peritonitis which was vaguely termed idiopathic? Doubtless in the vast majority of cases it originates in the appendix, the stomach, or the tubes. Still, from time to time instances occur in which the viscera appear healthy, and there is nothing to show from what source the invading organisms came. The term "primary peritonitis," qualified by the name of the germ if possible, seems here to be justifiable. Professor Osler¹ mentions 102 cases of acute peritonitis which proved fatal at Baltimore. In twelve of these the infection was confined to the peritoneum itself. Most were mono-infections, streptococci being present in five cases.

I have used the term "peritonitis" instead of the more accurate one "peritoneal infection," though some have regarded the former as a cloak for ignorance. But it must be clearly borne in mind that peritonitis is an infection of a large serous sac, and that it is not necessarily an inflammation, in the ordinary sense of the term, accompanied by its cardinal symptom, fever. Indeed, an acute infection of this membrane is usually associated with a normal, or subnormal, temperature and a small, rapid pulse. These symptoms indicate the absorption of toxins, for the treatment of which surgery alone—and that not long delayed—is of any avail. Some of the following cases will show this clearly.

A woman, aged 42, was admitted on March 22nd, 1904, with dyspepsia. In 1894 she first suffered from it, and a gastric ulcer was diagnosed. Ever since she has had pain and vomiting after food. On March 19th last she had pain in the epigastrium; next day she was taken suddenly worse in the afternoon and vomited in the night. On the 22nd she vomited again and was brought to hospital. Her temperature was then 100·4°, pulse 92, and respirations 32. The lower half of the abdomen was rigid, slightly distended, and tender. The liver dulness was normal in extent. Her bowels had not acted since the 21st and no flatus had passed. The next day the distension was increasing and enemata had no effect. She had not vomited again, her temperature was not raised, and pulse was 100 and fairly strong. On the 24th, there being no improvement in condition, laparotomy was performed. The first incision was made from the ensiform cartilage. No free gas was found on opening the

¹ *Medicine*, p 597.

peritoneum, nor was there flatus in the stomach. No adhesion or thickening of that viscus was felt. The second opening was made above Poupart's ligament and the appendix explored. It did not appear diseased, but some thin pus was found in the peritoneal cavity. A third incision was made in the middle line downwards from the umbilicus. The uterus, broad ligaments and ovaries were explored, nothing abnormal being detected, but more pus was found in the pelvis. The lower part of this incision was left open and the wound drained. After the operation the pulse was 100, but she continued to vomit for two days, and enemata had no effect. She was then given calomel in full doses, and later castor oil. The bowels then acted, and the sickness and distension disappeared. She made an uninterrupted recovery and was discharged five weeks from the date of admission.

A staphylococcus was grown from a specimen of the pus, confirming the opinion formed at the operation from the character of the pus, that it was not due to the *Bacillus coli*; in which connection it is worthy of note that the smell of pus is no criterion of its toxic qualities, as witness the inodorous result of the virulent streptococcus and the stinking pus of the colon bacillus.

The past history of this patient would have led one at first to think that the peritonitis was due to the perforation of a gastric ulcer. One point against this was that the area of liver dulness was not lessened, which was confirmed by no gas being found free in the peritoneal cavity. As the distension and constipation persisted it was considered best to operate whilst her pulse was still good. It will be noticed that the constipation and distension persisted after the operation. Had this been left unrelieved the result would have been disastrous; nothing is more important in the after-treatment of such cases than the regular evacuation of the bowels. This holds good not only in acute cases like this, where the intestines are paralysed as a result of peritonitis, but also in the ordinary cases of appendicitis operated on in an interval of quiescence; or in those cases where the gut, having been freed from some adhesion, is very apt not to recover its tone for a time. The regular use of enemata seems the best method of attaining this result; in suitable cases I have also seen good results from the administration of strychnine.

Following on this case of primary peritonitis due to staphylococcus, comes one where the pneumococcus is the agent of evil. In the same ward, in the previous year, a woman, aged 27, was admitted on February 26th, complaining of headache and general pains. Her temperature was 104.2° , and she had a rigor. On the

following day signs of general peritonitis followed. A large polynuclear leucocytosis was present. On operation on March 2nd the appendix was found to be constricted at its base, dilated, and full of mucus above. It was ligatured and removed. There was some thin, turbid, dark-coloured fluid in the peritoneal cavity, but no adhesions were found, nor was there any evidence of the perforation of a viscus. A culture of the fluid showed the presence of pneumococcus. Becoming worse, antipneumococcic serum was injected. Later on the pleural cavity was infected, but after resection of a rib and the evacuation of twelve ounces of sour-smelling pus, the further progress of the case was uneventful.

This case was discussed at a meeting of the Clinical Society last January. Professor Marsh was unable to state whether the case was one of primary appendicitis, but he considered that pneumococcal peritonitis must be added to the list of conditions which imitate appendicitis.

As to the connection between this form of peritonitis and lobar pneumonia, it was stated that of 182 fatal cases of the latter disease at Guy's Hospital in the last five years, in which necropsies had been made, only five showed any evidence of infection of the peritoneum, and that was slight. At the German Surgical Congress of 1903, Dr. von Brunn read a paper on this variety of peritonitis. In his experience the symptoms were comparatively mild; in the early stages it was liable to be mistaken for appendicitis, a point of difference being that in peritonitis there was more often diarrhoea.

From the pneumococcus and the staphylococcus we come to the tubercle bacillus. This may give rise to conditions in the abdomen of which, though they have existed for a long period, the symptoms may exactly resemble the sudden onset of a typical attack of acute appendicitis.

J. R., aged 27, was admitted on November 25th, 1903, with the following history. After being in his usual health, and having suffered from nothing of the kind before, he was seized on the night of November 11th with sudden pain in the abdomen. He was in bed at the time. The pain was over the whole of the abdomen and continued for two hours, when he was violently sick. Next day he went to work. He took nothing but milk, and in a few days the pain gradually disappeared. During most of this time his bowels had not been open, though before coming to hospital they yielded to castor oil and enemata. On admission his temperature was 99° and pulse 64. There was slight pain and tenderness in the abdomen, a small hard mass being felt in the right iliac fossa. He

was kept in bed for a fortnight, during which time there was no return of symptoms, and on December 11th laparotomy was performed. The appendix was not found, but the hard mass was found to consist of a caseating mesenteric gland, which was removed. The sutures were taken out on the tenth day and he was discharged on January 5th.

Here you have several symptoms which are very characteristic of the ordinary acute appendicitis. The onset was quite sudden. It occurred at night, which is very often the case. Indeed, in children a history of recurrent attacks of stomach-ache when in bed, some hours after food, should always lead one to think of the appendix as a possible source. Again, it should have been stated that he had been for a long walk that afternoon—his occupation not being an active one. It seems almost as common for an attack to be preceded by some unwonted exertion as it is by an error in diet. And yet, with all this, the condition found on operation, allowing for the period of rest, could not well have been more chronic.

The following is another case illustrating the way in which tubercular peritonitis may simulate appendicitis, and what an advanced condition it may reach with very few symptoms of its widespread nature.

G. T., aged 5, admitted April 28th, 1904, with the history that last October she was suddenly seized with an attack of acute pain in the right iliac fossa, accompanied by frequent vomiting. She had similar attacks at intervals for the next two months; then she apparently completely recovered, except that constipation persisted. Ten weeks ago she had measles, followed in a month by another attack of vomiting and pain in the same region; lastly, a fortnight ago, yet another, though slight, attack. She was a delicate-looking child, though in good condition; her temperature and pulse were normal; she complained of pain in the right iliac fossa, where there was some resistance on palpation, but no swelling. After being kept quiet for three weeks, during which time there was no return of symptoms and her pulse and temperature were normal, the abdomen was opened on May 20th. The intestines were found to be densely matted together, and the cæcum to be universally adherent. The appendix was not searched for. Further operation being hopeless, the abdomen was closed. She progressed uneventfully and was discharged on June 7th.

In spite of evidence of such extensive disease the symptoms had been those of typical attacks of recurrent appendicitis, in the intervals of which the child was in fairly good health and com-

plained of nothing but constipation. The tubercle may have invaded the peritoneum from the mesenteric glands, the cæcum, or the appendix. The enormous mass of adhesions found here is very characteristic of tuberculous peritonitis; in some cases they are found to bind all the abdominal organs together as if they had been fixed by plaster of Paris.

Attention has been drawn to the frequency of attacks of appendicitis in women at the menstrual period, this organ sharing in the general congestion. Here is a case where the disturbance occasioned by that process simulated very grave disease, the symptoms ending with the onset of the flow.

A young woman, aged 18, came in on the evening of April 8th, complaining of great abdominal pain, which came on suddenly in the forenoon of April 5th, accompanied by vomiting. For the past two years she had had attacks of pain and vomiting at intervals, and last summer brought up a pint of dark blood. On this occasion there was no hæmatemesis. There was great pain in the abdomen and imperfect movement, also tenderness in the epigastric region. Her pulse was 132, temperature 102·4°. A blood count gave 17,200 leucocytes. Widal's test was negative. Next morning her temperature fell to 98·2° and pulse to 96, pain was much less, and menstruation was reported to have set in the previous night. The following day all pain had disappeared, and she was discharged quite well on the 14th.

The symptoms, coupled with the past history of hæmatemesis, pointed very much to perforation from a gastric ulcer, possibly leaking into a shut-off cavity. But the often useful rule that a rise of both temperature and pulse is not so likely to mean perforation as a fall of temperature with a rapid pulse held good in this instance. It should have been said that on admission friction under the left breast was said to have been heard by one observer. Had pleurisy been present and spread to the diaphragm the symptoms would very likely have been referred to the abdomen, but they would not have passed off so rapidly as the above did.

We now come to the case of a young woman where nothing was found to account for her symptoms. A young widow, aged 25, with one child, has had for the past year pain in the epigastric and right hypochondriac regions, extending sometimes to the lumbar area. At times it comes on acutely and interferes with her duties. It is much worse after a hard day's work, or if she catches cold. She has no pain when lying down. She has also had pain down the right leg. Once or twice she has been unable to micturate all day,

and on the following day has passed a large amount of water. Three weeks ago she had a very severe attack of pain and was recommended by her doctor to come to hospital, which she did on November 28th. His impression was that the trouble was caused by a floating kidney.

She is a particularly strong, healthy-looking, country woman. Temperature normal, pulse 76. There is pain on palpation all over the abdomen, more particularly in the epigastric and right hypochondriac regions. The abdominal aorta is felt to be pulsating in a marked manner, otherwise nothing can be felt. There was the same negative result on examination by the rectum and vagina.

On December 4th an incision was made downwards from the umbilicus, the abdomen was opened and the kidney explored, with no result. The appendix was then brought outside the wound. It appeared to be healthy, but it was considered advisable to remove it. The wound was then closed. She made an uninterrupted recovery, and was discharged on December 23rd, stating that she was quite free from pain. A month afterwards she wrote to say that she was perfectly well and had had no return of her symptoms. The appendix was examined and found to be free from disease. In some positions of the appendix it is very near to the kidney, and the symptoms of the one are very liable to be referred to the other. Renal pain is rarely referred to the epigastrium; that due to the appendix not uncommonly so. The pain down the leg she complained of is sometimes met with in appendicitis, due to the spread of inflammation to the sheath of the psoas. In this case the examination by rectum and vagina revealed nothing, but it should not be omitted in such cases: the appendix may hang down into the pelvis, or a small twisted ovarian cyst may be the cause of the symptoms. The fact that nothing was found and yet her symptoms disappeared after operation may be accounted for in two ways. I know of cases, believed to be those of renal calculus, where nothing has been found on operation, and yet the symptoms have entirely disappeared after it. In a recent article Mr. Arbuthnot Lane¹ explains this as follows: "Where fæcal matter is allowed to accumulate in the intestines, one of the most favoured spots is the cæcum and the ascending colon. From irritation by fæcal masses its walls become inflamed and adhesions form between it and the adjacent wall of the abdomen externally, as well as in the neighbourhood of the kidney. When you cut down, expecting to find a stone, you

¹ *Lancet*, January 2nd, 1904.

carefully separate the kidney and its pelvis from the surrounding structures, explore the organ, and find nothing. Nevertheless, all pain and discomfort ceases from that date. The adhesion which probably caused a kink in the bowel at the hepatic flexure has been broken down and the obstruction removed." Though no marked adhesions were found in this case, it is possible there may have been very slight ones. I have seen two years' persistent pain ended at once by the breaking down of a tissue-paper-like adhesion between the stomach and the abdominal wall, an adhesion which was far too weak to affect the shape of the organ in any way. The other explanation is that she might have been cured by hypnotic suggestion. The pulsation of the aorta and the history of periodical retention of urine are in favour of a nervous origin, which her appearance did not in the least suggest.

Speaking of the nervous origin of symptoms, here is a case the sequel of which it is difficult to explain except on that theory. A strong, robust lad, aged 17, came to hospital on February 2nd. His story was that on January 16th, after lifting heavy boxes, he had a severe attack of pain in the right side of the abdomen. He kept at his work for the next few days, the pain being intermittent. On the 29th he was worse and a few days later he came to hospital. He had never had anything of the kind before, but had suffered at times from stomach-ache; had always had good health. On admission temperature was 98.2° and pulse 72. The abdomen was not distended and moved well on respiration. There is an extremely tender spot an inch below and two inches to the right of the umbilicus. His bowels are open freely. On February 4th he complained of a severe increase of pain in the right iliac fossa, which was very tender: nothing was felt. His temperature was normal, and his pulse 96. Two days afterwards the appendix was removed. It appeared to be quite healthy, but contained a small quantity of faecal matter. In the next five days he went on perfectly well, and then suddenly his temperature ran up from 98° to 103.6° , he had a rigor, and complained of great pain in the abdomen. The wound was opened up at once and everything found to be normal; it was closed, and he has gone on perfectly well since. This sudden disturbance is hard to explain. In an adjacent ward I saw the same thing occur in a girl who had been in bed for months with sacro-iliac disease, with no rise of temperature. One day, with no apparent cause, she had a rigor and her temperature ran up to 105° . In a few hours it was normal and remained so. An opportunity does not often occur of examining what proved to be an aseptic wound

five days after operation. No adhesions were found and the various layers had united separately. Apart from this episode the case is fairly typical of a large class of such, in which no signs of inflammation are found on operation and the appendix appears to be normal, perhaps containing, as in this instance, a little fæcal matter. There was no history of attacks of pain localised in the appendix region, though there was of "stomach-ache." The onset was sudden, and attributed to exertion. To this class belongs the next patient.

J. S., aged 26, was admitted on December 8th for abdominal pain in right iliac region, which he stated came on suddenly ten days ago, when he was at work. He had no vomiting then, but was very constipated. He kept to his bed till coming to hospital, the pain being intermittent. He has had two previous attacks of abdominal pain, one in December, 1902, the other in June, 1903, but on both these occasions it was not localised to any particular region of the abdomen. He has never had any vomiting, but has always been constipated at these periods. This was the case on this occasion, when his abdomen was found to be rigid, and there was tenderness in the right iliac fossa. Temperature and pulse normal. After being kept quiet for a week, the pain soon disappearing, the appendix was removed. There were no adhesions or signs of peritoneal inflammation, but the organ was swollen and kinked. He made an uninterrupted recovery.

Resembling the two previous cases, in that no signs of inflammation were found in the appendix on removal, but differing from them in that there had been several definite attacks of localised pain, is the following one. A girl, aged 16, comes into hospital on February 7th with this history. During the past two years she has had four attacks of abdominal pain. The first was in June, 1902. As so often happens, it came on suddenly at night. It was low down in the right side of the abdomen. She vomited, and for several days afterwards was constipated. There was also a history of fever. She felt unable to do her work, but did not take to bed till that evening. She stayed in bed two days and got up feeling quite well. Up to the present time she has had four such attacks, all much of the same character. The last one, a month ago, was the worst and she remained in bed a week. She finds that she is unable to eat anything indigestible without bringing on an attack. A long walk or a bicycle ride has the same effect. After a week's rest her appendix was removed. There were no adhesions or signs of previous inflammation, but it was a little swollen and kinked, being bent almost at a right angle by a very short mesentery.

Now these three cases agreed, in that no signs of inflammation were found on removal of the appendix; in two it was kinked, in the third there was faecal matter in the tube. In symptoms they differed somewhat; the girl had a history of several attacks localised in the right iliac fossa; one boy had a history of "stomach-ache," and typical cases of appendicitis are often, especially in children, preceded by what are considered to be attacks of indigestion; the other boy had a distinct history of attacks of pain which were felt all over the abdomen. What was the cause of these symptoms?

It has been stated¹ that every instance of so-called appendicular colic, slight appendicitis, catarrh of the appendix, and so forth, is really dependent on an actual inflammation of the appendix, and that of a bacterial origin. The absence of signs of inflammation and of bacteria in the organ when removed, are accounted for by the suggestion that they have disappeared in the quiescent interval usual before operation. Yet where there has been inflammation, and the patient has been kept quiet for two or three weeks after the temperature has fallen, one is sometimes surprised to see, not how few, but how many signs of past trouble are present. The adhesions may be so vascular and oedematous that it would appear better to have delayed even longer before operation. It is difficult to understand how, if the former class of cases were due to inflammation, it had not spread through the walls of the appendix to the peritoneum and caused adhesions around it.

The explanation of others, who say that many of these transient cases are not inflammatory in origin, but are caused by the efforts of the distended appendix to get rid of its contents, resulting in colic, seems to me more reasonable. It is known that when non-striated muscle is stimulated to strong contraction violent pain results, as in biliary and renal colic. This would explain the sickness and pain, and also the sudden cessation of these symptoms when the offending matter is expelled. One does not assume that an attack of local peritonitis accompanies every case of biliary colic. The appendix may be distended by its own viscid secretion, or by a concretion formed *in situ* round a nucleus which may, or may not, have come from the cæcum. The condition found in these three appendices will explain the obstacle of the egress of their contents. In one, the straight one, there was present faecal matter, which is foreign to the healthy appendix. It had not been there long enough to become hard, but was still able to block the tube. In the others

¹ Hunterian Lecture, *Lancet*, March 14th, 1904.

the organ was kinked by a short mesentery, in one case nearly to a right angle. Even then, under ordinary circumstances, it might allow the passage of its contents into the cæcum. But given any condition which still further reduces the lumen of the already narrowed tube, a spasm of the muscular wall ensues and severe pain, referred to widely-spread areas, is felt. Such a cause would be catarrh of the intestines spreading to the appendix, as does that of the duodenum to the gall-ducts. And catarrh may be caused by errors in diet, by constipation, or by exposure to cold and wet; there is often a history of such in these cases. Again, a twist or kink in the appendix may be aggravated by severe muscular exertion increasing the pressure on the abdominal contents; it is noticeable how often an attack follows unusual efforts. A curious instance of mechanical obstruction is related by Dr. McDougall in the *Lancet* of February, 1903. His patient in ordinary health was suddenly seized with a severe attack of abdominal pain followed by profound collapse. The abdomen was opened as soon as possible, but nothing was found except a barley corn, apparently of recent entry, impacted in the appendix. Sir Frederick Treves says that "the greater proportion of cases of appendicitis recover spontaneously." Doubtless this class contains many of such cases as the above, where there has been no implication of the peritoneum. But it can easily be seen how such an event may supervene at any time. The engorged appendix may become strangulated and gangrenous; or short of that, its walls may become so damaged as to permit of easy passage of bacteria to the peritoneal cavity; perforation in the ordinary sense is no more needed than in intestinal obstruction preceding peritonitis. The great difficulty is that the transient symptoms of these cases, where the appendix is only temporarily obstructed, are often exactly simulated by others where structural changes are already present. Here is a case in point.

A farm labourer, aged 35, came into hospital on March 9th. His story was that up till February 1st he had never been ill, nor was there any history of even abdominal discomfort. On that day he had his tea as usual, at 4.30, and went to bed at 9.30 feeling quite well. After he had been in bed for an hour he was seized with violent pain in the right iliac fossa, which kept him awake all night. In the morning he vomited once, he felt ill, and was constipated for the next three days, but from that time had felt quite well. He appeared to be in perfect health in every way, and nothing abnormal was detected in his abdomen. A few days later

his appendix was removed. It was very tense and distended, like a sausage, with a very tight constriction close to the cæcum, formed by adhesions. Their condition warranted the belief that they were of much older date than the late mild attack, which was the first of which there was any record at all. And yet from the state of the organ there was the risk of strangulation and gangrene at any time. So that, though one cannot help believing that there are many cases in which, at first, inflammation does not play any part, yet their symptoms may be so exactly simulated by others, even apparently first attacks, in which the gravest possibilities exist, that these should never be lost sight of.

Before passing on from these non-suppurative cases to those in which pus has formed, I will digress for a short space to describe Mr. Bowlby's method of operating during the quiescent interval of such cases, as it differs from the plan I have usually seen described in the text-books. The great point of it is that the rectus muscle is used as a buttress for the scar. An incision is made from the umbilicus through the anterior layer of the sheath of this muscle, parallel with its outer edge, but half an inch internal to it. The rectus is then retracted towards the middle line, whilst a further incision is made through the posterior layer of the sheath and the peritoneum. On closing the wound these two layers are united by one series of sutures, the muscle slips back into its place over them, and the anterior layer of the sheath and the aponeurosis are taken up together, and lastly the skin. In a fortnight the patient is out of bed, and, as far as the scar is concerned, could play football in a month. No belts or trusses are needed. This method of opening the abdomen also has the advantage that the incision can be prolonged, if necessary, without dividing muscle fibres, and should there be need to explore other organs it affords a ready access to them.

I will now consider some cases which have gone on to supuration.

A. B., a carpenter, aged 18, was admitted on Sunday, November 22nd, 1903, with the following history. On the previous Thursday he was quite well, and there was no history of similar attacks. At 9 p.m. on Friday he felt a pain in his right groin and vomited several times during the night. On Saturday he went to work, but the pain continued and he had to give it up. He walked to the hospital next day. His temperature was then found to be 102·8°, though his pulse was only 96. He looked very ill. There was a slight swelling in the right iliac region and the skin over it was red, hot, and

very tender. In the evening, after a few hours' rest in bed, his temperature was down to 98.8° , but his pulse had risen from 96 to 112. Next morning his temperature was 100.6° and pulse 104. In spite of having had nothing by the mouth he was vomiting. In the afternoon his temperature was 98.8° and pulse 116, rising to 120 shortly before operation. His abdomen was distended and no flatus passed. By an incision over the swelling some thin pus was evacuated, which appeared to be shut off from the general peritoneal cavity. No search was made for the appendix. The wound slowly granulated up and he recovered after a long illness. This case well indicates the great importance of the relationship between pulse and temperature. If the temperature is falling at the same time that the pulse is running up, and especially if there be vomiting, it points to immediate operation. It will be noticed that the appendix was not sought for. To have done so would have been to run the risk of breaking down adhesions and of flooding the peritoneum with pus. The gut in such cases is apt to be soft and friable. It is best to merely drain. The *débris* of the appendix, or concretions, if any, will probably come away in a few days. A few of these very acute cases of suppuration recover, without operation, after a desperate illness. In such there is not the same indication to operate for the removal of the appendix, after recovery, as there is in the milder cases. The chances are that it has already been destroyed by the intensity of the disease, and that everything is matted together in its neighbourhood. By interfering you run the risk of doing more harm than good.

Now comes a case where, though pus was present in large quantity, most of the signs of it were absent for a long time. An enormously stout man, weighing about 20 stones, with a hand's breadth of fat covering his abdomen, came to hospital on May 14th, complaining of pains in the abdomen, especially in the right lower quadrant. He stated that they began four days before, and had been gradually getting worse. He had not vomited at all, but had been constipated for some time. His temperature was 100.2° , pulse 84. Nothing could be felt in the abdomen owing to fat.

His temperature rose to 102° one night, but after his bowels had been cleared out by enemata it did not rise above 99° at night, and a degree less in the morning. Pain passed off and he appeared to be doing well. On the 22nd a blood count gave 22,000 leucocytes, and the next day fluctuation was detected. An incision was made and half a pint of pus was let out. He made an uninterrupted recovery.

In this case the temperature came down after enemata, the pulse was 70 to 80 throughout, and there was very little pain. The indication given by the leucocytosis proved to be correct. Opinions differ about the value of this sign. It has the charm of novelty, and perhaps too much is expected of it at first; but if taken in combination with other signs it may be most useful. Sometimes it misleads; I have seen a case where there was a leucocyte count of 27,000 and a temperature chart pointing to pus. Instead of a pelvic abscess a hæmatoma was found. In another case in which it was absent a large abscess was evacuated next day. Perhaps the safest line to take is that its absence proves nothing, though its presence is confirmatory. Especially is this the case where the blood counts show a progressively increasing leucocytosis. Speaking generally, the more intense the poison and the greater the resistance, the higher will be the leucocyte count.

I will conclude the series with the worst case which I have ever seen recover. It illustrates not only that general peritonitis may be present for two or three days without many of the characteristic signs, but also that pus may form in large quantities during apparent intervals of improvement and give no indication of its presence.

A young blacksmith, aged 22, was admitted on January 14th, complaining of constipation with considerable abdominal distension, but not much pain. His temperature was 101° and pulse 96. He was greatly relieved by enemata, which brought away large fæcal masses, and on the afternoon of the 15th his temperature was 99° and pulse 80. The distension remained, but he had no sickness or pain, and there was no indication for operation. For the next two days his progress appeared satisfactory, his bowels were open freely and he was much more easy; pulse about 70 and temperature 99°. On the evening of the fourth day he was suddenly seized with great pain in the abdomen, and showed all the signs of intense toxæmia. The abdomen was opened and a large quantity of pus evacuated. He was almost pulseless, and it was doubtful if they would get him off the table alive. However, they did so, and he rallied in such an extraordinary manner that for the next six days he appeared to be improving rapidly, his pulse being about 100° or under, and his general condition far better than could have been expected. He was then taken very much worse and a large sub-diaphragmatic abscess was found and evacuated, the pleural cavity being also involved. Then, again, for four days his temperature fell to normal, his pulse was 100 or under, he was quite free from pain, and very

cheerful. On the 27th he vomited, the abdomen was distended, there was tenderness over the pubes, and he had pain when micturating. An incision was made over the pubes and a pint and a half of pus let out. After this there were no more collections of pus and he recovered slowly. In seven weeks' time he was sent to the convalescent home, all the wounds having closed except the thoracic one. When I saw him two months afterwards he had put on several stones in weight, and except that the upper opening had not quite closed, was apparently well: an example that there may be a chance for the most hopeless.

The absence of symptoms in this case was very marked. Here was a man whose pulse was not increasing in rapidity, who was not vomiting, and whose bowels were freely open, and yet he had general peritonitis and a large collection of pus in his abdomen. The same lack of symptoms is to be seen in the intervals between the operations when pus was forming in large quantities. The toxins seem to have had a cumulative effect. Sub-diaphragmatic abscess is not an uncommon complication where the appendix has been the origin of mischief. The other localised collection of pus in his pelvis was faithfully indicated by the pain in micturating just prior to his last relapse.

In relating the above cases I have tried to deal with the points of interest in each as they occurred. To recapitulate briefly: To start with, there were two cases which show that, though we no longer speak of "that heaven-sent peritonitis which was called idiopathic," still, from time to time, instances occur in which none of the viscera appear to have been the starting point of the mischief, and so, perhaps, we are justified in speaking of primary peritonitis; a term which can usually be qualified by the name of the offending organism. Then came two cases of chronic tuberculous disease, the one local and the other general to the peritoneum, whose symptoms resembled those of acute appendicitis of the milder type. Next was one where the disturbance caused by menstruation simulated a perforation of the appendix or stomach, the history of hæmatemesis adding to the probability of the latter.

The symptoms of another young woman, apparently due to the kidney or appendix, disappeared after the abdomen had been opened, though nothing was found. After this were four cases illustrative of catarrhal appendicitis, so called. They showed that in some cases there is every reason to believe that the symptoms of this variety may be due to temporary blocking of the appendix, and not to inflammation; that, on the other hand, inflammation may

readily follow if this condition is prolonged, and that it is very hard to say when it is not present, a case being quoted of apparent appendicular colic, and a first attack, where old adhesions were found with the possibility of the gravest results.

Finally came three cases where suppuration had taken place. They showed the importance of the pulse as opposed to that of the temperature, the help that leucocytosis may give in diagnosis, the latency of symptoms during pus formation, and the possibility of recovery in the gravest cases.

The lesson to be learned from these cases seems to me to be that the symptoms of disease within the peritoneum are protean ; that one must regard the mildest of such cases as fraught with the gravest possibilities, and the most quiescent interval with danger ; and that of all signs the one to be most relied upon is the condition of the pulse.

A NOTE ON THE ADMINISTRATION OF ANÆSTHETICS
BY NON-COMMISSIONED OFFICERS OF THE ROYAL
ARMY MEDICAL CORPS.

BY CAPTAIN F. E. GUNTER.

Royal Army Medical Corps.

AFTER reading the recent Circular of the Director General *re* instructions and practice in the administration of anæsthetics, it struck me that, after all, is it imperative that anæsthetics be given by officers? Could not the duty be equally well performed by reliable and trained Non-Commissioned Officers? I knew that this was done in the American Army for I had assisted at operations in which chloroform was given by the hospital steward. To ascertain if it was usual for Non-Commissioned Officers to give anæsthetics in foreign armies, I sent round a circular to the various Legation Guards here (Peking), asking if chloroform was given by subordinates and, if so, did they receive any special training? In reply to this, the French, Russians, Italians and Austrians, said that no one but duly qualified doctors were permitted to give anæsthetics. The Americans replied, on the other hand, that all men are trained for that purpose, and the Germans and Japanese replied that they train their Non-Commissioned Officers. They are permitted to give anæsthetics, but only in the presence of a Medical Officer. The advantage of Non-Commissioned Officers being eligible for the administration of anæsthetics is obvious. It often happens that in small stations there is only one Medical Officer. He must, in such a case, call in the aid of a civilian if an anæsthetic is required. This gentleman may not be at once available and dangerous delay may occur. Again, supposing there are two. It would in many cases be most desirable that an assistant be available for the operation, and the Medical Officer would probably be of greater assistance than a Non-Commissioned Officer. In the larger hospitals it would not be so important, but granted that Non-Commissioned Officers are permitted to give anæsthetics in the smaller hospitals—if the principle be right, then they might equally logically be permitted to give them in the larger hospitals. There is no legal objection that I am aware of. Second year's students give anæsthetics constantly in Edinburgh and elsewhere, and our Non-Commissioned Officers are, as a rule, more reliable men than junior students. I think the American plan of

training all men is undesirable. I think that specially reliable Non-Commissioned Officers should be chosen from the nursing section and trained for this duty. The training could, I suppose, be carried out efficiently at our larger Military Hospitals, such as Netley, Aldershot, Woolwich; or better, perhaps, arrangements might be made for them to attend a large civil hospital for this purpose. At the end of the course they should go through a searching examination and then should receive a certificate stating that they are qualified as anæsthetists. The course, in fact, should exactly correspond with that which medical students have to attend in anæsthetics before receiving their diplomas.

NOTES ON THE TREATMENT OF FUNGOUS LYMPH GLANDS.

By MAJOR A. W. BEWLEY.
Royal Army Medical Corps.

MOST officers of the Corps are familiar with the large and indolent wound left after the removal of masses of inflamed lymph glands from the groins of patients under treatment for abscesses complicating gonorrhœa or venereal sores, whether this be done by means of Volkmann's spoons or by dissection.

Especially in the tropics, when the patient is probably broken down by disease or by the effects of climate, healing is as a rule tedious, and a large depressed scar is left which may interfere with the free use of the limb.

Not being satisfied with the results of operation, I tried several kinds of escharotics, with the idea of removing layer after layer of the inflamed glands, and found that the use of perchloride of mercury produced a superficial slough, and that by repeated applications the glands were eventually removed without pain or inconvenience, while the resulting scar was smaller than that after an operation.

The drug is best applied finely powdered, and care must be taken that none touches the skin, or pain will be complained of. In case of large masses of glands, a small crystal or two may be pushed into the substance of the gland with a wooden probe. The application must be repeated every two or three days, and antiseptic poultices employed to remove the sloughs. In a remarkably short time a healthy granulating surface is left, which rapidly heals.

The following cases may serve as examples :—

(1) Private S. was admitted suffering from multiple sores on the corona, which were followed by suppuration of the lymph glands of both groins. The abscesses were freely opened at intervals of a few days, and the pus evacuated, but large masses of inflamed glands protruded from the wounds, which prevented healing. Perchloride of mercury was dusted on, and the application was continued every three days for about three weeks. The result was most satisfactory, and the scars on both sides were firm, and did not interfere with marching or gymnastic training.

(2) Private H. suffered from a phagedænic sore on the glans penis, followed by a large bubo in the right groin, which was freely

incised. Healing could not take place because of the large cauliflower-like mass of glands which protruded from the wound, but rapid sloughing took place after the introduction of several crystals of perchloride of mercury into the enlarged glands, followed by repeated applications of the powdered drug, and in three weeks from the date of incision the wound was completely healed.

I have employed this method for the past twelve years, and have found no ill effects in any of the numerous cases in which it has been used, while the length of time under treatment is materially shortened.

THE SPREAD OF THE INFECTION OF ENTERIC FEVER BY FLIES.

BY MAJOR A. R. ALDRIDGE.

Royal Army Medical Corps.

THE following fragmentary notes were not intended for publication at the present time, but my work on this subject having been necessarily stopped for a period, and the subject having been raised in this Journal by Mr. Austen, may perhaps justify their appearance in immature form.

Direct evidence of enteric fever being disseminated by flies is at present scanty, and opinions have been based chiefly on numerous instances of the prevalence of the disease at the same place and time with an abundance of flies, coupled with the well-known fact that these insects feed on almost all kinds of human food, and choose filth and excreta for laying their eggs in. The markedly greater prevalence of the disease where dry methods of removal of excreta are in use, as compared with water carriage, is possibly to be explained by this means of dissemination. Not only is this greater prevalence to be noted in armies on active service and in countries such as India, where dry methods are universal, but also in numerous instances in Europe, in places where the two methods are in force side by side.

Further, the well-ascertained fact that mounted corps suffer more from enteric fever than dismounted, is also possibly to be accounted for in this way.

Admission Rates per 1,000 per annum.

BRITISH TROOPS IN INDIA, 1895—1900.				UNITED STATES ARMY, 1890—1896.			
Cavalry	..	..	40·6	Cavalry	..	..	5·74
Infantry	..	..	26·0	Infantry	..	..	4·74

Flies are undoubtedly more numerous in the lines of mounted than in those of dismounted corps, owing, no doubt, to stable litter being a favourite breeding place for them.

Now, it seems to be assumed by several recent writers on this subject, that the danger of this means of dissemination may be met by the proper burial of excreta; and it does not appear to be generally known that filth trenches are—in certain climates, at any rate—themselves the breeding grounds of innumerable flies.

In Indian cantonments the usual method of disposing of excreta

is by removing about 3 inches of soil, loosening 9 inches more, depositing the sewage in this, and replacing the soil. In trenches made in this way, as well as in trenches of 12 inches deep, I find the common house fly (*Musca domestica*), or a species closely resembling it, breeds in enormous numbers. The numbers vary with the season and place, but as regards most stations in the Bengal command, they are greatest in early summer and in the rains. These are the two well-marked seasons of enteric fever. Warmth and moisture seem to be the favouring factors. The intense heat of summer seems to dry the soil too quickly for it to remain a suitable nidus; while very heavy rain and the cold of winter similarly have a deterrent effect. By turning up the soil of trenches of different ages, the stages of development can easily be followed; they appear to be approximately:—

HOT WEATHER.				COLD WEATHER.			
Eggs	..	..	1 day.	Eggs	..	..	2 days.
Larvæ	..	..	5 days.	Larvæ	..	..	14 „
Pupæ	..	..	3 „	Pupæ	..	..	5 „

The house-fly appears to be somewhat difficult to rear under artificial conditions, and my experiments in the laboratory have not been complete enough to decide the exact duration of the different stages. Adult flies are not, in most cases, to be found in large numbers at the filth trenches, no doubt because they do not find their natural food there; but by turning up the soil of the trenches of suitable age, larvæ, pupæ, and the recently hatched flies, with their wings still soft and unexpanded, are to be seen in enormous numbers. For instance, in about one pint of soil taken from a trench, 520 pupæ were counted and from these 329 flies were hatched. The numbers are so great as to make it difficult to avoid the conclusion that a large proportion of the flies that swarm in the barrack latrines and kitchens come from this source. It seems most probable that the eggs are laid in the filth in the latrines, and the larvæ hatched out after it has been put in the ground. If, therefore, the eggs can be killed in the filth before burial the propagation of the flies will be put a stop to. I find that the eggs are somewhat resistant to most chemical substances:—

Common salt, 10 per cent., immersion for 2 hours	..	..	{ Larvæ hatched out.
Mercuric chloride, $\frac{1}{1000}$, immersion for 2 hours	..	..
Crude carbolic acid, 2 per cent., immersion for 2½ hours	..	..	No larvæ hatched out.

On the other hand, immersion in any fluid for twenty-four hours seems to kill a proportion of the eggs and all larvæ. As it seemed

probable that a still larger proportion of the eggs would be destroyed by the putrefaction processes going on in liquid sewage, while all larvæ hatched out would be killed in twenty-four hours, the following experiment was made. A certain number of filth receptacles were left full of sewage and closed for twenty-four hours, and the sewage then trenched in the usual way, but apart from the other trenches. No larvæ or pupæ were afterwards found in the ground where this was done, although they were extremely numerous at this time in the other trenches.

From these observations it seems probable that treatment of the sewage in a septic tank would lead to the destruction of the eggs or the larvæ as they were hatched out, provided it be allowed to stay in the tank from twenty-four to forty-eight hours. I hope to carry out experiments on these lines shortly with a tank specially designed to check the rapid flow of fluid from the inlet to the outlet.

As in most cases in India effluents could be disposed of by irrigation and need not be discharged into water-courses, it would seem that further aerobic bacterial treatment (in contact-beds or continuous filters) would, in many cases, be unnecessary. The amount of added water required for the septic tank action would not be large; from previous experience I have found three gallons per head amply sufficient, and probably less would do, as a high chemical standard of purification is not necessary.

In some parts of lower Bengal a "green-bottle" fly (*Pycnosoma* or *Lucilia*) is to be found in great numbers in the latrines and on the faecal matter. Where this fly is bred I have not traced, but it is not common in the barrack kitchens or on food, so would seem less likely to be a carrier of infection than the house-fly.

Clinical Notes.

TWO CASES OF SNAKE BITE (RUSSELL'S VIPER).

BY LIEUTENANT-COLONEL W. B. THOMSON.

Royal Army Medical Corps.

PARUMAL, a Tamil employed by the Commissariat Department, stated to be 35 years of age, but looking considerably older, and Meenakshi, his daughter, aged 13 years, were brought to the Station Hospital, Meiktila, Burma, at about 11 p.m. on the night of March 13th, 1901, with a history of having been bitten, about an hour before, by a snake. The man presented two distinct punctures, about $\frac{1}{4}$ -inch apart, near the knuckle of the index finger of his left hand; the girl two similar marks, one less apparent than the other, about the centre of the dorsum of her left foot. The injuries, it appears, were sustained as follows: the girl, on stepping into their hut, trod upon a snake and cried out that she had been bitten. The man, with a stick in his right hand, and a small light held close to the ground in his left, proceeded to search the floor. He saw the snake, and was in the act of striking it, when it bit him on his left hand and escaped. He described it as "a short, striped snake," and called it a "Kutta Virian." This is the Tamil name for "Russell's Viper." A stout linen band tied tightly around the man's wrist, and a silk handkerchief below the girl's knee-joint, were applied by a friend within ten minutes or a quarter of an hour after the accident happened.

On arrival at hospital both patients complained of feeling "giddy," were very restless, and apparently in great pain. Expressions anxious. Skin cold and clammy. Pulse feeble, and in the case of the man at first scarcely perceptible. The seats of injury were hot and swollen. At the time there were 10 c.c. only of antivenum in stock. I administered 7 c.c. to the man, and 3 c.c. to the girl. These injections were made within an hour and fifteen minutes after the receipt of the injuries. In addition, treatment was commenced at once. Stimulants and ammonia were administered, and $\frac{1}{12}$ grain strychnine and 20 minims of ether given by hypodermic injection. The wounds were then scarified and made to bleed freely, permanganate of potash rubbed into the wounds, and the limbs placed in a bath of strong solution of Condy's fluid. During the night stimulants and ammonia were given at intervals. The man's urine, on examination made some two hours after receipt of the bite, was found to be loaded with albumen. A specimen of the girl's urine, obtained at the same time, showed no trace.

The next day, March 14th, the general condition of both patients was



To illustrate article by Lieut.-Colonel W. B. THOMSON, R.A.M.C.

much improved. The injured limbs, however, were now swollen throughout and very painful. The man had vomited freely during the night, and his pulse at times had been very feeble and compressible. His urine contained albumen to $\frac{1}{2}$ extent. The girl's urine was not examined in the morning, but the same evening was found to contain albumen "well-marked."

March 15th.—Limbs in both cases much enlarged and œdematous throughout. Lymphatic glands in the armpits and groins tender on pressure. Man's urine loaded with albumen. The girl's showed albumen well marked.

March 16th.—Urine in both cases contained albumen as before. Bullæ formed near wounds. The circumference of the injured limbs, as compared with the sound side, was as follows :—

PARUMAL.					
		At centre of forearm.		At elbow joint.	Around armpit across shoulder
Left or injured side	..	11 $\frac{1}{2}$ inches	..	12 inches	.. 18 $\frac{1}{2}$ inches
Right side	..	10 $\frac{1}{2}$ "	..	9 $\frac{1}{2}$ "	.. 16 $\frac{1}{2}$ "
MEENAKSHI.					
		At middle of calf of leg.		At knee joint.	At middle of thigh.
Left or injured leg	..	14 $\frac{1}{2}$ inches	..	14 $\frac{1}{2}$ inches	.. 15 $\frac{1}{2}$ inches
Right or sound leg	..	9 $\frac{3}{4}$ "	..	11 $\frac{1}{2}$ "	.. 13 $\frac{1}{2}$ "

During the night of March 16th the man vomited frequently, and on the morning of the 17th was much exhausted. His bowels, which had been confined, had acted three times. One motion was reported as containing blood. He had passed no urine. The œdema had extended across the front of his chest and up the root of his neck. Pitting on pressure was well marked, to the *right* of the sternum. He rambled in speech, and dyspnœa was troublesome. He sank into a state of "coma vigil." There was slight strabismus of the left eye. He died at 1.30 p.m. the same day, about eighty-seven and a half hours after receipt of the injury.

The girl, "Meenakshi," remained under treatment for eight weeks, making a good recovery without any impairment in the movement of the foot. The attached photograph shows the slough separating, three weeks after the injury. During the time she remained under observation the urine was examined at intervals, but no albumen was found after March 18th, when a trace only was present.

A CASE OF DRACUNCULUS MEDINENSIS (GUINEA WORM).

BY CAPTAIN E. W. SIBERRY.

Royal Army Medical Corps.

GUNNER J. McC., aged 22 years, reported sick at the Station Hospital, Thobba, India, on August 9th, 1904. Complained of having something the matter with his right foot; he gave a history of it being in the same condition for about five weeks, and that it had not prevented him from doing his duty, nor had it caused him any inconvenience beyond being slightly irritable at times. He was quite sure he had not injured it in any way, but thought he must have been bitten by an insect.

On Examination.—His right foot was found swollen and œdematous, especially on the dorsum, but there was no pain, no redness and no mark of any kind which would point to an insect bite. Patient was detained and hot fomentations were applied frequently. He had no constitutional disturbance.

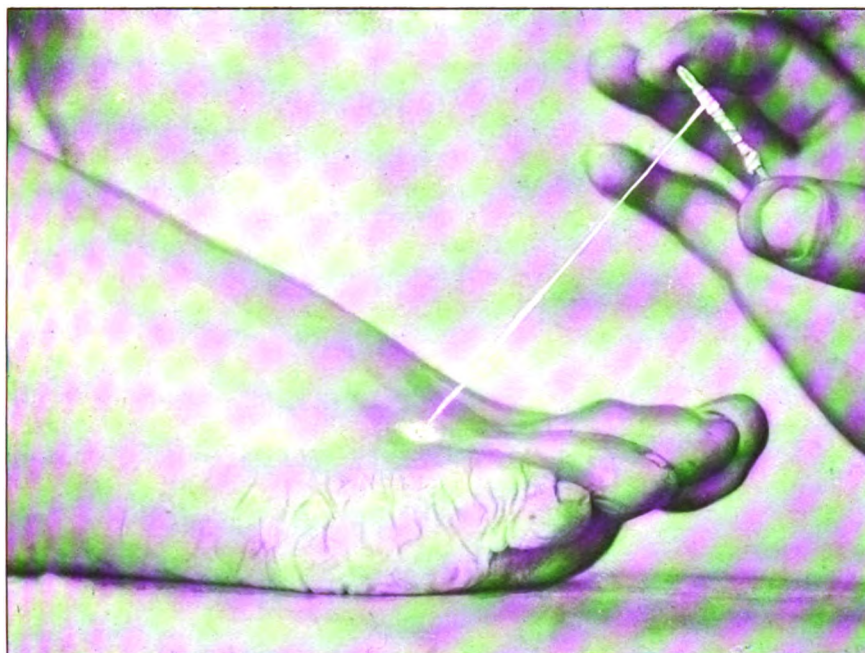
August 10th.—No alteration in appearance of foot; patient given an aperient and the fomentations continued.

August 11th.—To-day foot is more swollen and very much inflamed, and the skin in one part (on the dorsum about one inch above web between fourth and fifth toes) was hot, red, tense and smooth, but no fluctuation could be elicited.

August 12th.—Foot to-day same as yesterday, except that a small pustule has arisen over seat of inflammation mentioned, this pustule burst on slight pressure, and a small quantity of yellow fluid escaped; this was followed by the escape of a good quantity of sanguineous fluid; as foot had got worse instead of improving, patient was admitted to hospital.

August 13th.—To-day some more yellow-looking fluid escaped, and a small opening, punched out in appearance, and large enough to admit an ordinary probe, was noticed in the centre of the raw surface, which remained when the pustule burst; the foot was fomented again, but it became so painful in about half an hour that the patient was driven to remove the dressing, when he found a piece of white substance protruding about an inch out of the small opening. It looked like a piece of thin twine, cylindrical, milky white, very smooth and shiny, and without any markings; this was secured by rolling it on a match; now the diagnosis was certain for the first time, and the treatment accordingly changed from hot to cold douching and cold dressings, and every possible care taken to prevent the worm getting broken. This treatment was continued, and on an average a little more than an inch a day came out and was secured as before.

August 24th.—This morning, on removing the dressings, the worm was found broken, and the portion out measured fifteen inches. Foot was douched with cold water, without any apparent result, and a cold dressing applied. About 2 p.m., on opening the dressings, the worm was again



To illustrate article by Capt. E. W. SIBERRY, R.A.M.C.

found protruding about one inch, this was secured on a broken thermometer and the treatment continued as before. Something over an inch a day came out till the 30th, when about eight inches came away, and in the evening a tapering bent end was found outside the puncture; this second portion measured eighteen inches; making a total length of thirty-three inches, and the whole took eighteen days to come out. For two days prior to the worm being found broken a distinctly fætid odour was noticed from the foot.

Patient was discharged to duty on September 2nd.

Patient throughout had no constitutional disturbance of any kind, and the inflammation subsided almost immediately after the worm first made its appearance, but sanguineous fluid escaped each day as a fresh piece of worm came out.

This case, I think, is worthy of note for the following reasons:—

- (1) Its rarity amongst British troops.
- (2) Patient had only served in Ferozopore and Attock, and never in an endemic area.
- (3) The fact of the worm having broken when less than half way out not being attended by any serious consequences.

AMBULATORY ENTERIC WITH PERFORATION; OPERATION AND RECOVERY.

BY CAPTAIN J. W. WEST.
Royal Army Medical Corps.

G. H., a private in the 2nd Battalion Worcestershire Regiment, was admitted to the Military Hospital, Bloemfontein, on July 13th, 1904.

July 13th. *Family History*.—Unimportant.

Personal History.—He states he has not had any serious illness before. He is 19 years of age.

History of Present Affection.—The patient states that in the middle of the previous night he was seized with a violent pain in the stomach and vomited. The pain was very severe and the vomiting almost continuous. He describes the pain as being in the upper part of the abdomen, and points high up in the epigastrium as the seat of most tenderness. Patient was engaged in Field Training the day before his admission to hospital and at first stated that he was quite well until the onset of the pain, but on close questioning it was ascertained that ten or twelve days previously he had suffered from diarrhoea and a medical officer had given him some medicine which stopped it; on that occasion his temperature was also taken and found to be normal. He gives no history of previous gastric trouble.

State on Admission.—Patient very pale with an anxious expression,

and lay in bed with his legs drawn up. Temperature 100° F. Pulse 100. On inspection the abdomen was seen to be much distended and breathing entirely thoracic. He was very tender all over the abdomen, but particularly in the epigastric region. Abdomen tympanitic all over and liver dulness entirely absent. The vomit was dark in colour and had a faecal smell. He complained of great thirst.

Perforation of a hollow viscus was diagnosed and immediate operation urged on the patient, at first he refused, but later decided to have the operation performed.

Operation.—At 2 p.m., being about thirteen hours after the occurrence of the perforation, the patient was anaesthetised with chloroform and, assisted by Captain Humphry, R.A.M.C., I opened the abdomen in the middle line above the umbilicus by an incision $3\frac{1}{2}$ inches in length. On opening the peritoneum gas escaped under high pressure followed by turbid serum with flocculi of lymph, the peritoneum covering the stomach and exposed intestines was found to be acutely inflamed, but careful search revealed no perforation. This incision was sutured up by interrupted silkworm gut sutures, the whole of the abdominal parietes being included in the stitch.

A second incision $3\frac{1}{2}$ inches in length was now made below the umbilicus in the middle line; here the intestinal peritoneum was found to be intensely inflamed. A short search revealed a large perforation in the middle of a greatly thickened and indurated ulcer. The perforation would easily have admitted an ordinary lead pencil, and the thickening and induration extended for an inch all round. Other ulcers could be seen and felt above and below the perforation.

It was found that to close the perforation by sutures in the transverse axis of the gut would have almost obliterated the lumen, and as I did not consider the patient would stand excision and end-to-end suture of the gut, it was folded longitudinally over the ulcer and six silk Lembert's sutures inserted; the gut now appeared to be water tight. The abdomen was washed out with sterile normal saline solution, about two gallons being used. When all seemed clear, on moving the coils of intestine, another gush of turbid serum took place from amongst them, so I decided to drain the abdomen. The wound was closed with silkworm gut sutures with the exception of the lower inch, and here a gauze drain was inserted among the coils of intestine down to the region of the perforated ulcer. The operation lasted sixty minutes and the patient stood it well.

In the evening his temperature was 101°. Pulse 104, and respirations 36. He has been very sick since the operation but has not complained of much pain. Thirst still intense. Passed urine voluntarily without trouble. He is being fed by nutrient enemata 4-hourly.

July 14th.—Patient had a fairly good night, he had no sedative with the exception of $\frac{1}{4}$ -grain morphia given before the operation. Temperature 98.8°. Pulse 100. The vomiting still continues and thirst is intense.

One pint of plain water was given per rectum and retained, and this greatly relieved the thirst. He complains of some pain in the epigastric region.

At 1 p.m. patient was very restless, so $\frac{1}{4}$ -grain morphia was given hypodermically and he slept for the remainder of the afternoon. In the evening his temperature was 100·6°, pulse 96, and respirations 28. Vomiting still continues. During the day he was allowed to wash his mouth out frequently with water, and was given one teaspoonful of tepid water to swallow every hour. Passed urine normally.

July 15th.—Patient had a fair night and slept at intervals. Bowels acted twice and were typical enteric stools. Temperature normal. Pulse 92. Vomiting continues, and thirst still severe, but tongue is more moist. Still complains of the pain in the epigastric region. One pint of plain water given per rectum and retained.

Evening.—He had a fairly good day with the exception of the vomiting which still continues. Evening temperature 99·4°, pulse 96, respirations 26. His bowels acted six times during the day, and as all the nutrient enemata were rejected, it was decided to try and feed by the mouth in spite of the vomiting. Fresh chicken jelly was given a teaspoonful at a time, and was partly retained and did not seem to aggravate the vomiting.

July 16th.—Temperature this morning was normal, pulse 84, respirations 24. Patient complains that the pain in the epigastric region is very severe, so it was decided to dress the wounds and remove the gauze drain.

The dressing over the lower wound was seen to be slightly stained with serum. The gauze drain was carefully extracted and was immediately followed by a gush of fæces. The stitches in the abdominal wound seemed tight and the stitch holes inflamed. The wound was dressed with copious antiseptic dressing. On removing the dressing from the upper wound it was found that the lowest stitch had yielded and a portion of omentum about the size of a golf ball was protruding. Patient was anæsthetised, and I removed two more stitches, and, after careful washing with normal saline solution, I replaced the omentum in the abdomen and re-sutured the abdominal wound.

When the patient recovered from the anæsthetic, he expressed himself as much relieved and the vomiting ceased. In the evening his temperature was 100·2°, pulse 92. Tongue clean. He was allowed half an ounce of peptonised milk with an equal quantity of barley water by the mouth, and retained it, so feeding was ordered to be continued at frequent intervals during the night. Copious discharge of fæces through the lower wound necessitated frequent dressings.

July 17th.—Patient had a fair night; temperature in the morning 99·2, pulse 94. No further vomiting. Complains of some epigastric pain, so the upper wound was dressed and the stitches were found to be tense and the stitch holes and line of incision inflamed. He was very restless

during the day, so at 3 p.m. he was given $\frac{1}{4}$ -grain morphia hypodermically, and slept afterwards. Bowels acted once per rectum, and the dressings were frequently changed over the fistula. Broad adhesive plaster was applied round the abdomen as a support.

July 18th.—Temperature normal, pulse 92. He complained greatly of pain in the upper wound. This was dressed and found much inflamed, with points of pus at all the stitches; these were removed and the wound gaped at one place and some pus escaped. Abdomen well supported by strapping and binder. Has no sickness and takes nourishment well. The fæces coming from the fistula appear to be well digested.

July 19th.—Temperature normal, pulse 98. No pain. The wounds were dressed, and the upper wound was found to be gaping nearly two inches, and some pus escaping from the stitch holes. It was decided not to attempt to bring the wound together at present, as it is septic and would not be likely to heal, and also as there is adhesive peritonitis and no danger of general peritonitis. The lower wound had to be dressed twice during the day and not much fæces coming through the fistula. Bowels acted four times per rectum.

July 20th.—Temperature 99, pulse 80. His bowels acted three times per rectum, and as he had some pain a small starch and opium enema was given.

He is now taking 3 pints of peptonised milk and $\frac{1}{2}$ pint chicken jelly in twenty-four hours.

July 21st.—From this date the progress was uneventful; the discharge of fæces from the fistula gradually ceased, and at the end of August both wounds were entirely healed. On September 10th patient was up out of bed on full diet. Now, on September 20th, patient can walk about and feels quite well. He is putting on flesh rapidly. The lower wound is strongly healed; the upper wound has contracted to a great extent and it is unlikely that a hernia will occur through it. Patient has absolutely no abdominal pain, and his bowels act regularly.

General Remarks.—The case is one of great interest for several reasons.

(1) Undoubtedly cases of enteric fever of this mild nature may go through the whole course of the disease without reporting sick, and act as a dangerous source of infection in camps and cantonments.

(2) The case illustrates the marvellous recuperative powers of the peritoneum, which entirely recovered itself although exposed to the same infection which caused suppuration in the abdominal parietes.

(3) The use of a gauze drain in cases where there is doubt about the intestinal stitches holding, is also shown. The drain formed a channel amongst the coils of intestines, and undoubtedly prevented a fatal general peritonitis.

(4) The position of the pain and tenderness are of great importance. In this case it was entirely in the epigastric region, and in default of an accurate diagnosis before operation, this determined the site of the first incision.

A CASE OF LUMBAR ABSCESS OPENING THROUGH
SACRO-SCIATIC NOTCH.

BY CAPTAIN J. POWELL.

Royal Army Medical Corps.

THE following case came under my care in the Station Hospital, Umballa, Punjab, and presents a curious condition which, although similar cases are on record, is, I think, sufficiently interesting to publish a short account of.

Private C. J., 2nd East Lancs., attached to Telegraph Department, aged 26 years 2 months, service 7 years, was admitted into this hospital on August 13th, 1903, complaining of attacks of giddiness, fever, and pain over sacrum. The medical record showed two severe attacks of secondary syphilis, complicated with inflammation of spinal membranes and partial paresis affecting left arm. No tubercular taint. He stated "he had bruised his sacrum in June, 1903, by a fall, but this did not incapacitate him at the time, and up to the present date he had suffered no subsequent ill-effects." He complained of feeling "out of sorts" for the two days previous to admission, *i.e.*, the 11th and 12th inst. On examination: tongue furred, constipation, and slight tympanitis present. Over right sacro-iliac articulation slight hyperæmia was noted with tenderness on pressure and pain on rotatory movement of right leg being made. Purgatives and hot fomentations were ordered. From date of admission until August 27th condition remained unaltered, with varying temperature. Swelling appeared on 26th over right sacro-iliac joint, and on the 28th this was aspirated, when on pus being discovered a large free incision was made extending from half an inch below posterior superior spine for about four inches downwards. The glutæus maximus was cut through and a large quantity of foetid green pus was evacuated. The ilium between crest and superior curved line was exposed, but there was no evidence of erosion of bone. The wound was probed and a sinus was discovered leading towards hip joint about one and half inches in length. The cavity, which here was very small, was douched out with hot perchloride, 1 in 2,000, and a large india-rubber drainage tube was inserted. The wound was again dressed in the evening; there was a copious discharge. Patient felt better; temperature showed marked fall and kept low until the 31st inst., when it again rose. Free drainage was established and large quantities of pus daily drained, so much so that the dressing became soaked and necessitated dressings being changed four times in the day, perchloride 1 in 2,000 being used. Medicinally, patient was ordered iodide of potash and nux vomica.

The respirations were rapid and shallow, but no thoracic disturbance beyond very slight hypostatic congestion at base of left lung could be found. It was then noted that the patient kept his right leg semi-flexed, but could straighten it if required to do so, and did not complain of any pain while

doing this. On September 6th patient complained of pain in left shoulder-joint with swelling and tenderness. On the 7th, similar condition of right elbow-joint appeared; under treatment these conditions completely disappeared. Condition unsatisfactory; patient appeared to be losing flesh rapidly, although taking nourishment well. On September 11th condition became suddenly worse; vomiting; abdomen distended and tympanitic; very restless.

Turpentine enema was given at once. Rectal feeding and hypodermic of morphia was ordered. Discharge had rather increased than decreased. Wound looked very unhealthy, muscles having a "pus-sodden" appearance. Towards evening patient became delirious and noisy. Abdomen after enema became less tympanitic, flatus having been freely passed; but during September 12th abdomen again became tense. A soft tube was passed which gave relief. Stimulants and nourishment were taken well, rectal feeding being discontinued on September 13th. Pulse became weak and irregular and hypodermics of strychnine and digitaline were ordered. Friction sound was noted in fourth left interspace in front, very localised; no pain on pressure.

On September 14th patient became completely unconscious with very noisy delirium. Pulse feeble, rapid and compressible, and in the afternoon he became collapsed and died. Nourishment was taken well to end, but patient did not respond to stimulation. Autopsy was performed shortly after.

AUTOPSY NOTES.

Thorax.—Slight hypostatic congestion of base of both lungs, and very small pleuritic effusion into left pleural cavity. Heart normal.

Abdomen.—Viscera normal. Intestines slightly distended. Peritoneum viscera normal. Peritoneum, parietal congestion in right iliac fossa. Right psoas muscle bulged forward, and on cutting through this muscle a large abscess cavity was exposed. Psoas muscle was not involved. Course of pus could be traced over pelvic brim and through great sacro-sciatic notch into operation wound. The periosteum covering the right sacro-iliac articulation had disappeared, as also the upper portion of iliacus muscles. The sacro-iliac joint showed slight erosion. The sac of abscess was only traceable upwards for short distance. There was no appreciable vertebral disease.

The foregoing case appears to me to be of interest from a diagnostic point. There was marked absence of abdominal symptoms. The tympanitis present during disease with exacerbations, as on September 8th and 12th, might be explained by the presence of flatus alone, and certainly the autopsy showed no peritonitis. The absence of all abdominal pain and tenderness appears unaccountable, as one would suppose that a large abscess such as this was would cause either local or referred symptoms by pressure on nerve trunks. The flexure of the right leg was a late

symptom and did not give any diagnostic assistance, for movement caused no pain and the position was explained by patient as "giving him a rest." The pus track was perfectly marked at the commencement, but was more distributed on nearing the operation wound, and on this account pus welled into the wound on all sides, and not directly by a distinct opening through the sciatic notch. It was suggested at the time, that probing in this direction should be avoided, fearing pelvic infection might result.

In suggesting the original cause of the abscess I am inclined to put it down to syphilitic origin, although no vertebral disease was found.

The injury mentioned as having occurred in June, may have been sufficient to start an inflammatory condition at the sacro-iliac joint, and in this manner weaken this part and cause the pent-up pus to force its way downwards in this direction.

The patient's final condition was the result of septicæmia, although the drainage was free and an enormous quantity of pus was removed daily.

In writing this case it is my object more to leave it a subject for discussion than to attempt to explain the condition.

NOTES ON A CASE OF STRANGULATED CONGENITAL INGUINAL HERNIA.

BY CAPTAIN G. CARROLL.
Royal Army Medical Corps.

LANCE-CORPORAL J. E., 2nd King's Shropshire Light Infantry, was admitted to the Station Hospital, Ranikhet, October 10th, 1903, with a right inguinal hernia. He stated that about four years ago, while he was at gymnasium, the hernia first appeared. He fell out and was sent to hospital, but on the way there the gut returned, and fearing he would be kept in hospital he said nothing about it to the medical officer. The hernia has occurred frequently since, but he has always been able to reduce it himself and has never worn a truss.

On the morning of October 10th, 1903, patient was in perfect health, when suddenly, for no apparent reason, the gut descended. He had not strained himself in any way, and was doing nothing out of the ordinary. He tried to reduce it as usual, but found he could not do so; he then commenced to feel faint and had to lie down. Shortly afterwards he started vomiting and had colicky pains about the abdomen. He had a constant desire to pass flatus, but could not do so, and had a feeling as if it would give him great relief if his bowels were moved. There was no actual straining.

When brought to hospital, about 4 p.m., patient was in a collapsed condition, pulse small and thready, eyes sunken, and anxious expression. He complained of slight pain in the abdomen. His skin was cold and

clammy and temperature sub-normal. He still had frequent attacks of vomiting, which was bilious in character. On examination, a tense tumour was found occupying the right groin and descending into the scrotum; it had an impulse when the patient coughed and was resonant on percussion. There was no distention of the abdomen. Taxis was applied first without chloroform, and then with it, but without result.

I saw the patient at 8 p.m., in consultation with the Senior Medical Officer, Lieutenant-Colonel Nichol, and the following was his condition:—Expression anxious, eyes sunken, skin clammy, pulse small and thready, breathing shallow and almost altogether thoracic. He had the appearance of a man in the collapsed stage of cholera. He lay on his back slightly inclined towards the right side with the right leg drawn up. There was no distention of the abdomen, and he had not vomited for some time. The tumour was still irreducible, and it had increased somewhat in size; it was very tense, dull on percussion, and there was practically no impulse on coughing. The parts about the tumour were extremely tender and the local temperature seemed to be increased. Patient had all the symptoms of acute intestinal obstruction.

Considering the condition of the patient we decided to operate at once, fearing he might die of exhaustion during the night, or that the bowel would be irreparably damaged before morning. The parts having been shaved and thoroughly washed with soap and water and the skin disinfected, an incision was made through the skin and subcutaneous tissue over the neck and body of the tumour, extending from a point about midway between the anterior superior spine of the ilium and the spine of the pubes, and about one inch and a half above Poupart's ligament to about the middle of the scrotum. This exposed the tendon of the external oblique, from which the skin and subcutaneous fat were reflected for a short distance on each side so as to expose Poupart's ligament. The intercolumnar fascia was then raised and divided on a director, thus exposing the cremaster muscle and fascia, which was divided in a similar manner, and the sac was thus laid bare. The sac was now dissected out, and it was found that the spermatic cord was lying along the posterior aspect and the testicle was within the sac, thus showing that the hernia was congenital. The next step was to find if there were any constrictions about the rings, but none were found. The inguinal canal was opened up and it was found that there was no constriction at the internal ring, so it was evident that it was in the sac itself. Having made certain that there were no adhesions the sac was raised, and an incision having been made it was freely opened, using the fingers of the left hand as a director. This was very easily done, as the sac contained a large quantity of fluid, about three ounces.

The contents of the sac were now examined; at the lower part the testicle was seen perfectly healthy, and above it was lying a loop of small intestine, about four inches long. As yet no damage had been done to the

intestine; it was deeply congested, of a dark purple colour, and absolutely without circulation, but was quite firm, and had not lost its polish; there was no thrombosis of veins, and no hæmorrhages, nor were there any patches indicating peritonitis. An attempt was now made to pass a director through the neck of the sac, but this was found to be impossible. On examining the sac closely to find out the reason of this, it was found that at its lower part there was a narrow ring encircling the intestine, about one-eighth of an inch wide and half an inch in circumference. The neck of the sac just above this ring was now incised, and the ring, which was of dense fibrous tissue, almost cartilaginous in type, was divided from above downwards, great care being taken not to injure the intestine.

Almost immediately the last fibres of the ring were divided the intestine commenced to assume its natural appearance. The intestine was now pulled out slightly to see that there was no injury at the point of constriction, and, having been sponged over with very dilute warm carbolic lotion, was returned into the abdominal cavity. A finger was now passed through to see that there were no adhesions. The neck of the sac having been separated from the spermatic cord was ligatured with stout silk. The sac was now cut across, about half an inch below the ligature, the ends of which were left long. The finger was now passed through the internal ring and the peritoneum separated for a short distance upwards and slightly outwards; then using the finger as a director each end of the ligature was passed through the abdominal wall from behind forwards, well above the ring, about half an inch apart. These ends were now tied together, thus drawing the stump of the sac well away from the internal ring. The remainder of the sac was now dissected downwards and just enough left to cover the testicle. This was now sutured so as to form a new tunica vaginalis, and leaving a small part open for fear of a hydrocele forming.

The method I adopted for closing the canal was that recommended by Halsted with the exception of the incision upwards and outwards through the external and internal oblique and transversalis muscles. The cord being raised up and a finger passed inwards to prevent injury to the peritoneum, four silk sutures were passed through the whole thickness of the abdominal wall. The first was a single suture passing through the external oblique, &c., and through the outer pillar of the ring and external to the cord; the next three were quilt sutures and passed through internal to the cord. All the sutures were now tied, care being taken that the cord was not unduly compressed. The skin wound was now closed with interrupted sutures. The cord was thus lying on the aponeurosis of the external oblique with only the skin covering it. The wound was now dusted over with iodoform and a pad of borie wool placed over it; this was kept in position by a spica bandage tightly applied. Patient stood the chloroform very well and had no vomiting afterwards. He was not allowed to have anything for twenty-four hours, and was then

allowed a small quantity of soda-water, as he was constantly complaining of thirst.

The morning after the operation, patient's temperature was normal and he said that he had hardly any pain. In the evening his temperature was 99.4° , and was normal again the following morning and remained so till the evening of the sixth day, when it rose to 101° , but was again normal the following morning.

On the seventh day the dressings were removed, when it was found that the wound had practically healed, but it was noticed that there was some redness around the external suture. This suture, along with the one next to it, was now removed, but no pus was found; next day the redness was slightly increased, so I opened the outer corner of the wound and found about a teaspoonful of pus. A small piece of gauze was inserted to keep the wound open, but there was practically no more discharge. On the ninth day the remaining sutures were removed.

Patient was very constipated after the operation, and the bowels did not move without the aid of an enema, which was given every second day till the eighteenth day. From this time on patient made an uninterrupted recovery, being allowed to get up on November 5th, 1903, and was discharged from hospital in perfect health on November 20th, 1903.

The case is interesting in so far as it shows the number of days a patent funicular process may persist without a hernia finding its way into it, although the subject may be exposed to all the predisposing causes. It also shows, once the hernia has occurred, how it may lead to serious trouble on very slight provocation, and the advisability of operation on those suffering from hernia, and of early operation in cases of strangulation; as in this case, although the urgent symptoms had somewhat subsided, there is very little doubt that gangrene of the gut would have resulted had the operation been deferred till the following morning.

What evidently happened in this case was that on the previous occasions when the hernia occurred, only part of the lumen of the intestine entered the process, as in a Richter's hernia, but this time the whole circumference slipped through and the constriction was so tight that it was impossible for it to return. The strangulation was not the result of an accumulation of fæces, as the bowel was absolutely empty.

FATAL RESULT OF A FALL OUT OF BED.

By MAJOR H. S. PEEKE.

Royal Army Medical Corps.

PRIVATE L., 5th Royal Garrison Regiment, was brought to hospital on a stretcher at 1 a.m. on August 22nd, complaining of pain in the neck and inability to walk. He was sober. A comrade occupying the next bed stated that about midnight the patient, who had retired early, rose up to a sitting posture in bed, lost his balance and fell over, falling on his head. This statement was corroborated by the patient.

On examination there was tenderness and pain referred to the neck, no displacement apparent and none felt on deep pressure. Complete paralysis, motor and sensory, of lower extremities. Sensation was only impaired at the digital extremities, where anæsthesia was complete. Temperature 99°, pulse 65; respirations diaphragmatic and hurried. Treatment: he was placed on a water bed; pain relieved by morphia hypodermically and cold applications applied to the neck. Urine drawn off by catheter. On the following morning dyspnœa increased; he gradually fell into a state of coma and died.

Post-mortem examination.—Heavy muscular man, no external bruising. An incision extending from the occiput to below the seventh cervical vertebræ was made, exposing freely the spinous processes. On inserting the finger a spinous process was found to be detached. Further examination revealed a simple fracture through the base of the fifth cervical spinous process. There was extensive hæmorrhage and rupture of the dura mater and the anterior spinous ligament, there was no pressure of bone on the cord, but the hæmorrhage was marked, and this, added to inflammatory effusion, was evidently the cause of death. The fact of the patient only falling from a height of eighteen inches from his bed cot, did not lead one to expect that he had fractured his spine. No signs of displacement were apparent, nor could crepitus be elicited. It was thought to be probably concussion of the spine or hæmorrhage causing pressure. On this account no operative measures appeared to be indicated and such a rapidly fatal issue in little more than twenty-four hours, was not anticipated. Complete paralysis of the lower portion of the body extended up at first only to the middle of the breast. From the situation of the lesion and its relation to the brachial plexus, it might be expected that paralysis of the upper limbs would have been present, but there was scarcely any loss of power till just before death. Gurlt's tables show this paralysis to have been present in less than one-fourth of cases. Probably the incompleteness of paralysis is due in most cases to conservation of nerve fibres, although the medullary portion of the cord is compressed or completely crushed.

The case is of interest as showing how grave an injury can be produced by an accident apparently so trifling as falling out of bed from a height of only eighteen inches.

FISH BONE IN THE LUNG.

By MAJOR H. S. PEEKE.
Royal Army Medical Corps.

GUNNER C., R.G.A., was admitted into hospital on May 11th, complaining of pain in the chest and cough. Temperature 100°, pulse 90, respiration 20. He was anæmic and looked distressed. Previous health good. No history of any particular chill. On examination friction

sounds were audible on right side about sixth interspace in mid-axillary line. Resonance was impaired and respiratory murmur diminished. Coughing caused great pain. Expectoration was copious, viscid, tenacious. His progress was unsatisfactory, pyrexia with exacerbations continued, dyspnoea increased.

On the 16th signs of pleural effusion were present; the effusion appeared to be localised.

On the 19th he coughed up a large amount of muco-purulent sputum. This contained a large amount of muco-pus, many strepto- and staphylococci; no diplococci, pneumonia or tubercle bacilli were found.

On the 23rd, as his condition did not improve, it was decided to open the pleura. This was done by Lieutenant, now Captain, Barbour. Chloroform was administered and an incision made along the upper border of the sixth rib in mid axillary line, exposing the pleura. This was opened. On exploring deeply with the finger pus was reached. It was found on breaking down a few adhesions that there was a fairly small loculated abscess of the lung involving the pleura. This was swabbed out and a drain inserted. Wound dressed with iodoform gauze.

The recovery was uninterrupted and he was discharged to duty on August 1st. During convalescence he coughed up a considerable quantity of pus, and it was very evident that pus was being evacuated by the lung through the mouth. When discharged from hospital he still had a cough.

A fortnight later he reported himself and showed me a "bone," which he stated he had coughed up with great difficulty the previous evening, after a severe paroxysm lasting six or seven minutes. He told me that he felt much relieved about the chest and that his cough had left him since he had got rid of the "bone." On going into his history further, he stated that at Sheerness twelve months previously, while eating fish, a bone "went the wrong way" he felt discomfort at the time but it had not troubled him since. The foreign body was $1\frac{1}{2}$ inches in length and $\frac{1}{8}$ inch in breadth at widest part, slightly curved and flattened bilaterally with a small groove at its lower border. It gradually tapered off at one end into a point as sharp as a needle. Colour greyish, with the appearance of bone.

Professor Girdwood of McGill University, to whom I am indebted for kindly examining the specimen, reports that "chemically the substance consists of phosphate of lime principally, with a little carbonate of lime and fatty organic matter. This is the composition of the concretionary matters that are found in the lungs of those who have recovered from an abscess of lungs. The healing process is by caseation and disposition of calcareous matter, so that it is quite possible that one of the smaller bronchial tubes has been obliterated with caseation and ossification of the residue, and this may have been the result of the abscess. On the other hand, it may have been the fish bone inhaled into the lung

and worked its way out to the surface along a line of least resistance. Against such a supposition is the irritation and cough you would expect with occasional hæmorrhage as the pointed fragment worked its way outwards, and then fish bones are so easily digested and absorbed that you can hardly suppose it likely to have been carried so far without being absorbed, but it is just possible."

It is open to question how this foreign body got into the lung. I am inclined to favour the supposition that it was the bone previously inhaled, and it had the appearance of having partially undergone absorption. The history of it having been inspired, and the abscess of lung which followed its expulsion, point to this. The main consensus of opinion of those at the meeting of the Nova Scotia Branch of the British Medical Association before whom I brought the case, also favoured this theory.

A CASE OF CEREBRO-SPINAL MENINGITIS.

BY CAPTAIN H. ENSOR, D.S.O.,
Royal Army Medical Corps.

AND DR. A. BALFOUR, M.D., B.Sc., D.P.H., &c.

CEREBRO-SPINAL meningitis is endemic in the larger native towns of the Anglo-Egyptian Sudan, and is the disease from which the Mahdi is said to have died at Omdurman, 1885. In the autumn of 1899, a severe epidemic broke out among the black Sudanese regiments stationed in Khartoum and Omdurman, and we are informed that the loss of life from this cause was very severe, but, unfortunately, exact information concerning this epidemic is not now obtainable. Medical officers who were serving with the troops stationed in the district during the occurrence of the epidemic, have informed us that all the cases with one exception occurred among the negroes of the Sudanese battalions. The exception referred to was one of the orderlies, an Egyptian, Medical Corps, who was on duty in the wards reserved for cases of the disease. Cerebro-spinal meningitis being of comparatively rare occurrence in the British Isles, among adults at any rate, the following account of a case may be of some interest: On the afternoon of January 25th, 1903, Private S. K., 15th Sudanese, was brought to the Station Hospital, Khartoum, in a semi-comatose condition. He was quite unable to give any coherent account of himself, but his wife stated that on the day before he complained of headache, which became very severe on the morning of the 25th, and that he had fallen into the condition in which he was brought to hospital about noon of the same day. On examination, little or nothing could be made out. The patient lay on his right side with his right hand under his cheek, and the head itself bent forward on his breast. He could be roused, but was unable to say more than a few words coherently, and he resented being moved about. He had no sign of injury to his head; his

heart and lungs were found to be healthy, and his urine contained no albumen. His reflexes were normal, and there was no paralysis or contraction of any of his muscles. The history of severe headache and the consequent coma gave rise to a suspicion of cerebro-spinal meningitis, and the patient was immediately isolated. His blood was very carefully examined, as it was possible that the case might be one of the so-called "algide" forms of malaria, but no parasites were found after repeated examinations. His spleen was somewhat enlarged, but as nearly all the Sudanese suffer from splenic enlargement, the discovery of this condition was of little help in making a diagnosis. The temperature on the evening of the same day was 100.8° F. Ten grains of quinine were given hypodermically—as the absence of parasites in the peripheral blood cannot be said to finally exclude malaria—and a calomel purge, the lower bowel having first been cleared by an enema. On the morning of the 26th the patient's condition had changed for the worse; his temperature was 103.2° F., and his coma had deepened considerably. He seemed to suffer little or no pain in his head, and could be roused for a few seconds with great difficulty. The patient was again carefully examined, and an outbreak of facial herpes was noticed on the left side of his face; this was the only confirmatory sign of the suspicion of cerebro-spinal meningitis, and no other symptoms could be noted. The injection of quinine was ordered to be given twice a day, and nutrient enemata were given by the rectum, as the patient took nourishment badly by the mouth, appearing to have some difficulty in swallowing. The blood was again examined, and gave a negative result. On the morning of January 27th the diagnosis was apparent to every one, as he presented the typical symptoms of cerebro-spinal meningitis. The head was retracted, and the dorsal muscles rigid, causing the condition of orthotonos, the pupils were contracted, and another symptom of the disease, hyperpyrexia, occurred at 12.30 p.m., the temperature running up to 106° F. This condition was met by cold sponging, and the temperature reduced to 101° F. without difficulty. At 4.30 p.m. of the same day a spinal puncture was made, and three tubes containing different culture media inoculated with some of the spinal fluid.

An interesting point was the undoubted improvement that took place after making the puncture. At the time of the operation the patient's condition was very critical; he was entirely comatose, and his pulse rate uncountable. About half an hour after the operation his condition certainly improved considerably, and death did not occur until about twenty-eight hours after, although at the time of making the puncture he appeared to have only at most two or three hours to live. This improvement can only be attributed to relief of pressure by withdrawing some of the spinal fluid.

The patient died on January 29th at 8.30 a.m. A *post mortem* was performed immediately, and acute leptomeningitis found to exist. Smears

from the pus found on the surface of the brain were taken on cover-glasses as soon as the meninges were opened, and on staining them with methyl-blue, diplococci in large numbers were found lying in the pus cells, these organisms being in all probability the diplococcus intracellularis meningitidis of Weichselbaum.

When lumbar puncture was performed, three tubes were inoculated directly with the cerebro-spinal fluid, which readily flowed into the aspirating syringe. The considerable quantity of blood converted the agar slope into a blood agar. No growth occurred in the gelatine stab, but in twenty-four hours small colonies had appeared on the agar slope, and the broth showed a slight degree of turbidity. Both broth and agar were incubated at 37° C. In forty-eight hours these tiny colonies had begun to coalesce, and eventually formed a fairly luxuriant viscid growth. In addition, a pale orange-coloured colony developed, due to a bacillary infection. This was not studied further, being regarded as an impurity, and sub-cultures of the gray colonies were at once made to prevent contamination. Agar plates were also prepared and incubated at 37° C. Microscopical examination of both broth and agar cultures revealed the presence of a small diplococcus similar to that found in the pus smears taken from the brain at the *post mortem*. It stained readily with Löffler's alkaline methylene blue, but was decolourised by Gram's method. Its appearance strongly suggested the diplococcus intracellularis of Weichselbaum, and the probability of its being this organism was enhanced by the appearance of the colonies on agar plates. Most of these colonies were superficial, and presented a somewhat thickened and opaque centre, and a surrounding transparent zone, which by transmitted light exhibited a bluish tinge. In some the margins of the growth were broadly crenated. Most suggestive of all is the fact that this diplococcus lost its power of reproduction in about a week's time, and that those colonies which had developed ceased to spread, a fact most noticeable on the agar plates. The characteristics of the typical diplococcus are more or less negative, especially in this case, in connection with animal experiments. The same proved true of the organism in question. Attempts to inoculate two rabbits and a monkey with young agar cultures in their nasal cavities proved ineffectual, while a rabbit which received 1 c.c. of a twenty-four hours' broth culture, merely exhibited a slight and transitory pyrexia on the second day after injection.

There is so little to go upon in the case of the organism causing cerebro-spinal fever, that it is difficult to come to a definite conclusion regarding any coccus which may be isolated from a case of this disease; but by a process of exclusion it appears that this diplococcus was indeed that described by Weichselbaum. Jaeger's¹ recent conclusions do not help us much, and his diplococcus is probably a different organism. It

¹ *Cent. für Bakt.*, December 22nd, 1902, and March 20th, 1903.

frequently forms long chains when grown on culture media, is variable as regards Gram's method, and does not die out in culture like the typical diplococcus.

No other cases of cerebro-spinal fever have occurred among the men of the battalion from which this soldier came, and this is perhaps due to the precautionary measures taken as soon as the disease was suspected. The dead man having been married on the strength lived with his wife in the married quarters of the regiment. These married quarters consist of rows of mud buildings divided up into separate rooms, and in consequence it was not possible to destroy the infected quarter by fire, as would have been done in the case of an isolated hut. The infected room was limewashed, all clothing, &c., being disinfected by 1 in 1,000 perchloride of mercury, and the mud floor was dug up for the depth of about six inches, and the earth carried out to the desert to a place about two miles distant from the nearest habitation. When this had been done the room was closed, and orders given that it should not be inhabited for a period of six weeks. The wife of the deceased soldier was kept under observation for three weeks before being allowed to leave Khartoum. Up to the present no further cases of cerebro-spinal meningitis have occurred among the troops of the Khartoum garrison.

Travel.

A VISIT TO THE VICTORIA FALLS.

BY CAPTAIN J. W. H. HOUGHTON.

Royal Army Medical Corps.

As the Victoria Falls are now easy of access, a short description may be of interest to those contemplating a visit to them. Having obtained fourteen days' leave, my companion and self left Bloemfontein on September 9th, and after four days in the train arrived at Bulawayo, and next day motored out to Rhode's grave in the Matopos. A twenty-two hours' train journey from Bulawayo brought us to the Falls, where we arrived on the evening of September 15th, and as the train crawled around the final curve we heard their distant roar, and our first view was of several clouds of spray towering above the tropical foliage. We stopped at the small, comfortable, if expensive, hotel, which overlooks a great gorge through which the Zambesi runs below the Falls.

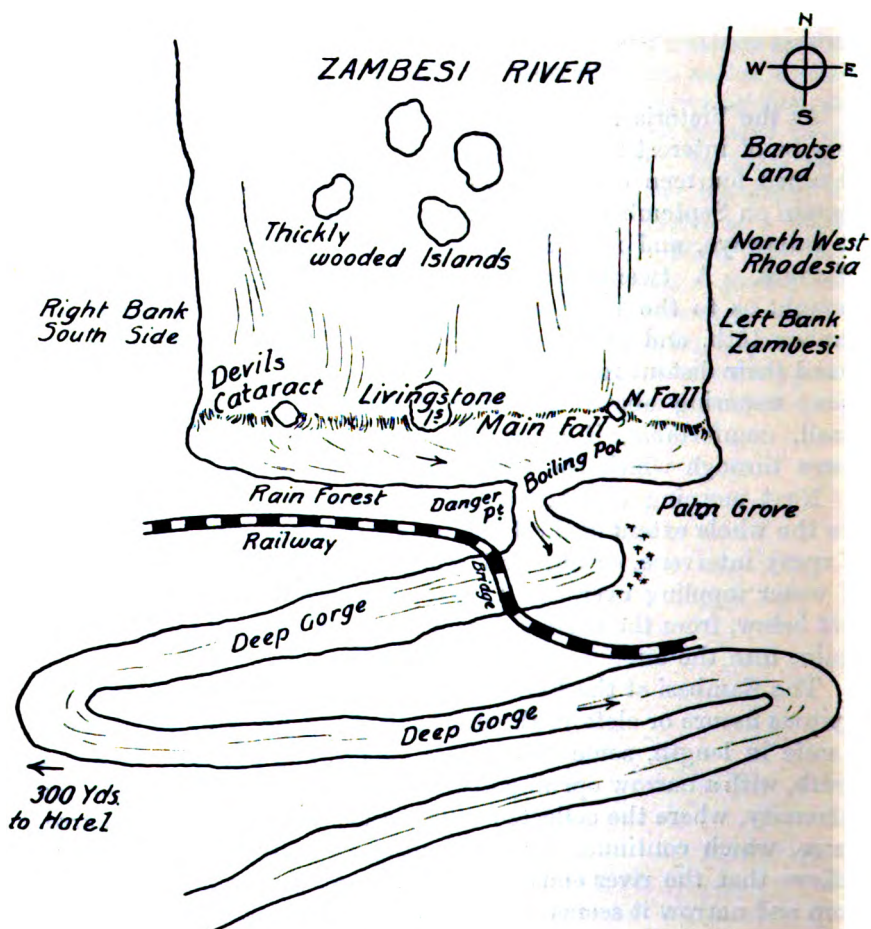
Next morning we started for our first real view. One cannot see the whole extent of the Falls from any given point, as the clouds of spray intervene, so our first glimpse was of a magnificent sheet of water toppling over the "Devil's Cataract" into an abyss 400 feet below, from the bottom of which rose a cloud of spray, as high again, into the air.

The Zambesi at the Falls, is a mile wide, and flows into a precipitous fissure or cleft in the otherwise flat surface of the country, a mile in length, some 400 feet in depth, and about the same in width, with a narrow opening about two-thirds distant from its right extremity, where the collected waters rush into a deep and narrow gorge, which continues for about forty miles below. The natives believe that the river ends at the Falls, as the gorge of exit is so deep and narrow it seems impossible that it can contain the waters of a mile-wide river.

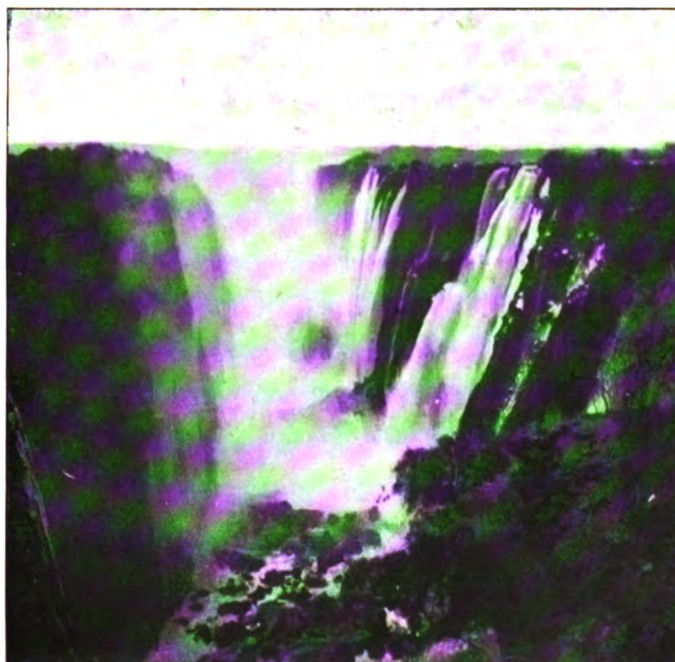
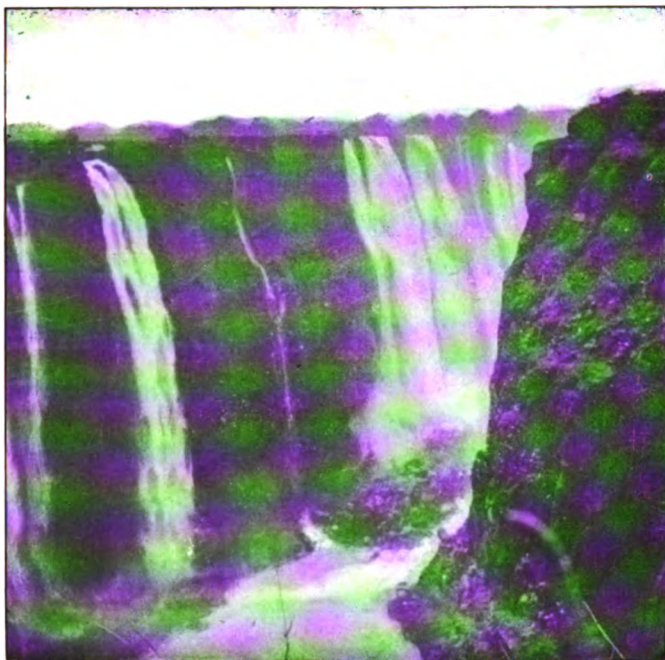
After contemplating the "Devil's Cataract" we walked along the southern cliff parallel and opposite to the Falls, where the spray is heavier, through a belt of tropical undergrowth, called the "Rain Forest." We got soaking wet, and could see little of the river on account of spray, but the "Rain Forest" has beauties of its own in ferns, mosses and lichens, on which fine spray continuously falls,

while numerous monkeys and strange butterflies played and fluttered in the foliage above.

Clear of the "Rain Forest" we came to the right pillar of the gorge through which the collected waters find exit, where an excellent view of the Main Fall and Livingstone Island was presented.



This extreme point of the right bank, called "Danger Point," separates the Falls from the gorge, across which the future railway bridge is in course of construction. We crossed in a cage swung on a steel hawser, a new sensation, as we saw the Falls through the "Boiling Pot" opening, and the water rushing through the cañon some 400 feet beneath. We went down the Palm Grove on the



To illustrate article by Capt. J. W. H. HOUGHTON, R.A.M.C.

northern bank, a steep descent through thick undergrowth and palms galore, and from the level of the water, looking up, could see the workers on the bridge as pigmies in the distance.

Next day we took a canoe with four Barotses as paddlers, and shot several rapids on the way to Livingstone Island—a small thickly-wooded elevation on the edge of the Falls between the “Devil’s Cataract” and “Main Falls”—on which Livingstone landed in 1855. We saw the tree on which he carved his initials—D. L.—now faint and high up, but probably genuine, as the cheap-tripper has not yet penetrated to this sanctuary of nature. We saw several hippopotami and one crocodile on our way back—but they did not invite a close inspection—as we paddled amongst the islands where the river is wide and running slowly. On our last day we walked up the right bank through dense foliage and innumerable palms, where the baobab tree grows to an immense size, while the river, studded with green islands, made a very pretty scene.

The rainbows, visible morning and evening in the spray from the Falls, are not to be forgotten, nor the lunar rainbow we saw during our last night; and in spite of the long journey back to Bloemfontein, the inconvenience was soon forgotten in the memory of the beauties of the Victoria Falls.

SOME NOTES OF A TRIP TO THE UNITED STATES AND CANADA, 1899.

BY LIEUTENANT-COLONEL J. G. MACNEECE.

Royal Army Medical Corps.

SOME readers scattered over the face of the globe, in stations where there is little or no sport, like Bermuda, might care to hear of a trip and some fishing I was fortunate enough to get in the United States and province of Quebec, Canada.

Quebec, alas, is no longer a British Army station, but garrisoned by the Canadian Royal Artillery, a sort of permanent militia, a fine body of men, well officered; there are also cavalry and infantry, but the latter are not permanently enrolled. Before proceeding further, I must express my great sense of the social hospitality shown by Canadians and Americans in New York, Philadelphia, Montreal, Quebec, &c. The clubs make honorary members for fourteen days of any Britisher or officer of His Majesty’s Service introduced by a member, and very pleasant hours I spent in the Union, University,

Garrison Clubs, &c., and their home hospitality is beyond belief. Nothing is left undone to make the guest's visit pleasant.

Golf is the present craze, their links are made to order as a rule, not natural, but kept beautifully turfed, and only playable from May to end of October in the Eastern States, on account of snow. Under the tutorage of Scotch professionals, in a year or so there will be some trophies carried away from the old country by American golfers, who have the "fever" badly, and devote all their time and energy to the game. (This was written in 1899, and the Championship this year (1904) was carried off by an American.)

I spent five very pleasant weeks in the neighbourhood of New York and Philadelphia, including a fishing trip to the Adirondack Mountains, of which more later; five days at the Falls of Niagara, a week on the journey to Quebec by steamer, across Lake Ontario, through the Thousand Islands, down the St. Lawrence, shooting the various rapids, of which the Lachine near Montreal are the finest and most dangerous. What struck me most was the highly cultivated and park-like country along the banks, the beautiful scenery, and the air of prosperity in Toronto and Montreal and the upper provinces.

June 5th, 1899.—Arrived at the Château Frontinac, Quebec, the best hotel in Canada as regards cuisine and comfort. At Quebec, fortunately for me, were many friends of my wife's family, who were most hospitable, and interested themselves to procure me fishing. Brook-trout fishing was easy enough, as I at once had invitations to consider myself honorary member of the Turilli Club (who own a very good river and lakes, some thirty-five miles from Quebec, and have a good club-house and caterer), and of the Statacoma Club. My friends shook their heads over salmon fishing, all the best rivers were taken up by Americans, who had either bought out or hired them from Canadians; and, best reason of all, on the few rivers owned by Canadians the parties were already made up; so made up my mind to confine myself to trout and ouananische fishing, made celebrated by Mr. Andrew Haggard's descriptions.

It should be mentioned that the Quebec Government charges ten dollars for a two-month fishing license to anyone not a resident of the province; that near the cities of Montreal, Toronto and Quebec, and along the lines of rail, all the lakes and rivers are owned by private individuals or clubs and preserved, consequently, unless by invitation, these are not fishable by a stranger, and he has to go long distances inland. Even the best fishing-places for

ouananische on Lake St. John are owned by the proprietor of the Roberval and Island Hotels.

June 10th.—Started for the Statacoma Lakes with W. B., one of four sporting brothers, equally at home in moccasins, snow shoes or canoes, and with rod, gun or rifle. The lakes are 100 miles from Quebec on the Lake St. John R. R., and on the other side is the famous Triton Club, and their range of rivers and lakes. The Statacoma Club consists of eight members, has a small but comfortable club house, and in addition to the lakes, owns a large tract of country round them, which is preserved for moose and cariboo shooting, and has also a good head of fur-bearing animals. My friend and one of his brothers had built a comfortable shingle camp on the largest lake, about eight miles from the club-house, for which we started early on the 8th, having to do one portage between the lakes. Got to camp about noon, had some food, and started live-bait fishing (gudgeon), until the sun got lower; caught six good fish.

In the woods the trees extend right over the banks of the lakes and rivers, so all fishing has to be done from flats or canoes. At 4 p.m. started for Lake St. Jean, two lakes and portages off, to fly-fish, the peculiarity of this lake being, that fish would not rise to the fly unless it was almost dead calm. We fished to the rises, the canoe men being very expert and darting towards a rise, over which one cast a fly, seldom without success. Between us we caught four dozen and a half. The black flies and mosquitoes were worse than I had ever experienced or imagined (they are very bad in Bermuda), even our French Canadian boatmen squirmed; the only thing to keep them off was a vile compound of tar and castor oil, with which I smeared my face, wrists, neck and hands; even this had to be applied every half hour or so.

June 12th.—Blowing a gale; fly-fished in the large lake in every likely place all morning, did not get a rise; in afternoon, at the suggestion of my boatman, went to the discharge, and caught a couple of dozen good fish in an hour, the rise then ceased; my friend did not catch a fish in the open water.

June 13th.—Gale still continuing, bait-fished in lee of an island, caught six good fish running from 2 to 3½ lbs. In afternoon went to Lake St. Jean, and wind having dropped, caught with fly twenty-five nice trout from a ¼ to 1½ lbs. in weight. Flies simply awful.

June 14th.—Still blowing a gale, broke up camp and started back to club-house. On the way anchored on a sand bar, and caught five beauties on a split cane 8 oz. rod, with bait, so they gave

plenty of sport. Weight $4\frac{1}{2}$, 4, $3\frac{1}{2}$ and two 2 lbs. each. The journey back by rail along the course of the Batiscan River was lovely. Along the line where there were clearings, it was amusing to see the cattle standing in the smoke of smouldering fires, which had been built on purpose to keep the flies off them.

The most killing trout flies are the Paracheeni belle, red ibis, red and brown hackles, royal coachman, white miller, grizzly king, abbey and silver doctor; these tied on a 3 or 4 hook are also good for ouananische, including ranger and Jock Scott.

June 17th.—Had made every preparation to start for Lake St. John, for a fortnight's ouananische fishing, which Mr. Andrew Haggard extols as the gamest fish of the salmon tribe, when I got a telephone from Allan B. saying, "Will you go salmon fishing in Moistic River? My brother has wired to me to bring a guest." Jumped at the offer. Monday was spent buying a rod, flies, lines, &c.

June 20th.—Started in a gale in a small coasting steamer for Moistic, about 500 miles from Quebec, on the north shore of the Gulf of St. Lawrence.

June 21st.—Had to take refuge in a cove for eight hours.

June 22nd.—Arrived at Seven Islands, near St. Margaret River, and heard we could not land at Moistic as no boats would venture over the bar, so landed at Seven Islands and were hospitably treated by Mr. Ross, agent of the Hudson Bay Company Post, and Mr. Le Galliene, a Jersey Islander, who put us up for the night, and made arrangements for a cart for the transport of our baggage along the coast. We started at 3 a.m., on a long tramp of eighteen miles to Moistic, arriving at 10 a.m.

A more desolate and unfertile coast than that of the north Gulf of St. Lawrence would be difficult to conceive. There are a few fishing hamlets scattered along it inhabited by hardy French Canadians who have absorbed the Scotch and Irish element; all talk French, few know English, the man who owned the cart was English, named Smith, his English was quite halting; said he had only spoken English occasionally for the past thirty years. On our way back we lodged at Moistic with people named Redmond, father and mother had been Irish, but the children did not know a word of English. These people lived by cod-fishing and salmon netting. Every mile along the coast is a cabin with ice-house to store the fish, a net about five hundred yards long runs out into the sea, and during the season these stations are visited two or three times a week by a sloop, and the fish are conveyed to the ice-house of the

Messrs. Holiday at Moistic, or some other trader, as the case may be, stored in ice, packed in wood boxes in snow ice, sent to Quebec by steamers and thence all over the United States and Canada as required. The Moistic River is netted for fourteen miles from the bar.

At Seven Rivers and Moistic the Indians were coming in with the result of their winter trappings, and disposing of them at the Hudson Bay post, where they camped in tents; they have nearly ceased to build wigwams, as the birch tree is so scarce along the coast in fact, they are now building canvas canoes on the lines of their bark canoes. Wonderfully good canvas canoes are made in the States, and when well oiled and painted they stand rough usage better than bark.

The French Canadians always speak of the Indians as "*Les Sauvages*," though many of them who visit the coast are partly civilised, their tents were clean, and some of them ran to sheets and small cooking utensils.

June 23rd.—On arrival at Moistic I found that the party of four rods had left two days before, having killed ninety-four salmon in sixteen fishing days, largest 37 lbs., average weight just over 20 lbs. V. B. and his fishing partner E. F., had very kindly left five of their best men to await our arrival, namely, two for each boat or canoe, and one to cook and look after camp and farmyard, consisting of fowls and a goat. Belledeau, the head guide or boatman, was a splendid type of the French Canadian voyageur, his home is a village on the St. Lawrence, near Quebec; he engages, and is chief of, the other men, many of whom live in his village. He remembers the 15th East Yorkshire Regiment, and ran off a string of names, now either Generals or gone to the "happy hunting ground," Dashwood, Lacey, Addie, and other Englishmen who used to fish the streams running into the St. Lawrence. He and his men are engaged by the same party every year, consequently they know every pool and current of the river. Camp Moistic is eighteen miles up the river and consists of the Château, a smaller shingle mess house, and kitchen facing the upper fishing pools, where the river is from five hundred to seven hundred yards wide. After a good breakfast with Mr. Holiday at 11 a.m. we left in canoes, doing a portage of a mile one third of the way up, cutting off an elbow of the river of about eight miles. Arrived about 12.45 p.m., finding the cook overjoyed to see us, he had been alone for three days; the heavy baggage came up later in flats, having followed the course of the river, which is picturesque, but barren

and uninhabited. At 4 p.m. we started fishing. By 5 p.m. I rose, struck, and after a breathless fight killed my first Moisis salmon, 15 lbs. in weight, a beauty, fresh run. As we were only two rods, and there were six good pools, besides others that held fish, we decided to fish day about, namely, one rod fished the lower pools one day while the other fished the upper, and *vice versa*, thus changing the monotony and increasing the rivalry. The river is tidal up to the pools, and is netted to within three miles of them. At this place there is a large salmon hatchery, owned by the Messrs. Holiday, who stock the river largely, and own the netting rights of the river and many miles of the coast. Our mode of fishing was from a long flat-bottomed boat worked by two men with paddles, as in a bark canoe. This flat was anchored at head of a pool, the man in the stern steadying the boat with his paddle; watching the single fly for a rise, one commenced to cast close to the boat on each side and gradually increased the length; in the event of a fish rising and being hooked, there was a mad rush, probably a succession of leaps, and the fish was away down stream with fifty or sixty yards of line out. In the meantime, Jules, the bow man, had up anchor and away we went down stream into the channel, clear of the pools; old Belledeau quivering with excitement, calling on Jules, making the boat spin along after the fish, myself reeling up as hard as I knew how, getting in slack till there was only twenty or thirty yards out. It was then that Belledeau was of such assistance, it was "Doucement! doucement! Jules, watch, be careful, M'sieu., to lower the point," as the fish would make a mad spring in the air. "Ha! ha! There goes our old friend, fine salmon;" chattering away to Jules in French, and Jules would translate for my benefit. Finally the fish, tired out in from thirty to forty minutes, after several vain rushes or else several sulks at the bottom, would gradually allow itself to be led into shallow water, where it was either gaffed by Jules from the boat, or by Belledeau from the shore—he seldom missed his strike; or perhaps a fish would rise short, Belledeau would say, "Cast on the other side," or else, "Light a pipe for luck," then if the fish rose and refused again, "Try another fly, M'sieu." "What will it be, Belledeau? Jock?" "Jock ecossais for choice." He had great faith in Jock Scott for a change, or if the fly was Jock Scott, "Well black dose is a vera good fly, we will try it," and very frequently the change brought the fish with a rush, and the fun began, sometimes ending in favour of the fish, but more frequently resulting in its capture. When I caught my second fish, a beauty of 20 lbs. weight, my arms were sore but my heart rejoiced, and

I yelled, "Shabash! Shabash!" This fetched my boatman tremendously when I explained its meaning, and they always took up this cry when I killed a good fish; perhaps the cry will warm the heart of some "Qui hai" in future years on the Moisie. Of course we moved along the pool, and if we saw fish rising in another pool, would try for them, they were fresh run fish, wonderfully strong, and, as a rule, very hard fighters. A. B. foul-hooked one fish, which took him down to the hatcheries, he was two hours killing it, weight 27 lbs.

I am not up in the natural history of the salmon tribe, and have no books here for reference, so make the following statement as regards salmon with reservation. There were two varieties of salmon, the most universal and hardest fighters being the usual type of small-headed fish, the other was large and heavy, with heavy head and curious snout or bill, called by the men *bec roche*, or snout salmon. I had intended to raise the question on my return to Quebec, but my stay was so short I forgot it. My stock of flies was not large, but selected by those who knew the river, and consisted of four of each of the following flies: size Nos. 4 and 6, double hooks, silver doctor, silver grey, Jock Scott, ranger, black dose, and donkey; of course there are about one hundred others, but men I met coming up from other rivers, said though they had tried many other flies, the above were the best all round and most used in Canada, at least on rivers along the Gulf of St. Lawrence.

June 23rd.—Day of arrival. Started fishing at 4 p.m.; fish shy, rising badly, an occasional roll betokened their presence, killed one salmon, weight 15 lbs., fly Jock Scott.

June 24th.—Started fishing at 10 a.m., little wind from east, finally calm, thunderstorm in the afternoon. I killed three before lunch, 15, 18 and 20 lbs. in weight. In afternoon lost one good fish, short hooked two, and killed one, 22 lbs. weight. A. B. killed four, weight 70 lbs., largest 27 lbs. Short hooked four.

June 25th.—Sunday. No fishing, went up river about two miles to a fine pool seldom fished on account of the rapids below; here we found grey seals at work, they are very destructive, come sneaking up at night and early morning, but later were bold enough to come up with the tide into the pools we fished, so we always kept a rifle in each boat; accounted for one and frightened many away. The Indians use them as food, and are allowed to hunt them in this pool, shooting or spearing them. One seal can clear a pool in a very short time, as the fish clear out when hunted.

June 26th.—Started at 8 a.m. on lower pools, immediately

hooked a fish and gaffed him at 8.30 a.m. At 10 a.m. hooked a very large fish, and either I put too great a strain on him, or, owing to bad fishing, the hook, a No. 6 (double), Jock Scott bent, and I lost the fish during what ought to have been his last run. Lost two more badly hooked before lunch; in afternoon, fishing from 4 p.m. to 7 p.m., killed one fish, 20 lbs. weight. A. B. killed four fish, weight 70 lbs.

June 27th.—Started fishing at 8 a.m., a dull morning, no wind, did not rise a fish though I tried half a dozen different sorts and sizes. At 11 a.m. A. B. was fast in a fish, immediately after I struck a fine fish, fresh run, took three-quarters of an hour to kill, fought like a demon, weight 24 lbs. As regards the rise, both A. B. and myself always noticed that if one struck a fish, the other was sure to get a rise almost immediately after, and when they were rising well to the fly in one pool, they were almost sure to do ditto in another. In afternoon, at 7 p.m., just before stopping, the last cast in fact, hooked a fine fish and killed in the dark, weight 24 lbs. It was seldom they rose as late as this. A. B. killed two fish, weight 25 lbs. and 28 lbs. These were all fresh run.

June 28th.—Clear morning, no wind, hooked one fish, but gut broke. Later raised several fish, short hooked two, caught one, weight 10 lbs. Afternoon, wind fresh from the east, a thunderstorm, hooked one fish, lost it. A. B. killed two fish, weight 12 lbs. and 19 lbs. Flies, ranger and Jock Scott.

June 29th.—Showery day, little wind; at 11 a.m. was fast in a fish, killed, weight 14 lbs. One at 5 p.m., weight 22 lbs.; one at 6.30 p.m., weight 12 lbs.; lost one at 7 p.m. Killing flies, ranger and silver doctor. A. B. killed four, weights, 25 lbs., 23 lbs., 22 lbs., and 14 lbs.

June 30th.—Showery morning. My best and record day on lower pools. Killed at 10 a.m., one, weight 18 lbs., fly black dose; killed at 11 a.m., one, weight 23 lbs., fly donkey; killed, afternoon, one, weight 23 lbs., fly black dose; killed, afternoon, one, weight 22 lbs., fly black dose; killed, afternoon, one, weight 20 lbs., fly silver doctor; killed, afternoon, one, weight 12 lbs., fly ranger. A. B. killed two, both 21 lbs. in weight, on Jock Scott and silver doctor.

July 1st.—Killed one fish at 11 a.m., 14 lbs., on Jock Scott, one at 3 p.m., 15 lbs., on ranger. A. B. killed three fish, weight not noted. Walked up to the basin and falls, twelve miles, a most trying walk, a mere Indian track for portage between the rapids and to above falls. Very heavy thunderstorm, river rising. At the falls

found some Indians spearing and netting salmon in the basin or pools below the falls, they ran at first, but as we blocked the way, sat down; Belledeau explained that we would not hurt them, which was politic, as they could have easily looted or burned the camp. They said they had been starving down at the Post, and had come up to kill seals, of which they had eleven.

July 2nd.—Last day. Very heavy rain during night, river had risen three feet. Impossible to fish lower pools, A. B. tried upper for an hour and killed one fish, weight 14 lbs.

Broke up camp at 11 a.m., as we wanted to get down before turn of tide, to fish for sea trout off the bar. Thus ended for me one of the best times I ever had. Killed twenty-one salmon, average weight $18\frac{1}{2}$ lbs., in seven fishing days. No blank day. A. B. went one better, killing twenty-two fish, average weight just over 20 lbs. Total, forty-three fish; no bad record.

Got to Moisisic village and went out to the bar mouth, but did not catch many fish; being novices, we did not fish close enough to the shore. Next morning at 5 a.m. we started again and caught four dozen nice fish, none very large, running from a half to 2 lbs. weight. In afternoon we caught seven dozen, throwing back all small fish, killing flies being Montreal, a claret-coloured body, and Paramochi belle, a brilliant gold-striped body with red and white wings. We had expected the steamer in on Tuesday morning, but it did not arrive till 6.30 p.m. on Wednesday, getting into Quebec Friday, July 4th, and starting for the Adirondack Mountains, New York State, the same afternoon. We found about a dozen salmon fishers on board returning from different rivers. The owners of the Godbeau River had been most successful, having killed over three hundred and fifty salmon, but then they own the netting rights, and do not allow netting.

Those on the St. John's, opposite Anticosta, had also good sport, killing ninety salmon, taking it very easy; those on the Metascasca killed about a hundred and fifty fish. But then there was just the reverse, some men who had gone down with us full of hope to small rivers, had either killed none, or one or two. The moral of it all is, that nearly all the best rivers are in the hands of Americans. Even to our camp, letters to the guides and boatmen were addressed:—

c/o Messieurs. Les Estrangeur Americanos,
Château Moisisic.

And the general assumption is, that if you do not speak French, you are American, not English.

The Adirondack Mountains.—The Adirondack guide is a descendant of the old settlers, with a good knowledge of woodcraft and the haunts and habits of deer and fish. His stock-in-trade consists of a knowledge of rough cooking, a creel, and a light boat capable of carrying three people and weighing from sixty to seventy pounds. This he slings over his head and carries from stream to stream, or from one lake to another. During the winter he works in a lumber camp on the lakes, thus living almost entirely in the woods. As a rule he is fairly well educated, a pleasant companion while tramping through the woods, rowing on the lakes or round the camp fire at night.

On arrival at New York stayed some three weeks with English friends, and on May 5th, just after the snow had melted, went with my host—a keen fisherman—to the Adirondacks. He is a member of the Adirondack League Club, which owns about 250,000 acres of wild forest land, with numerous lakes and rivers which are carefully stocked with brook and salmon trout (lake) and well watched, though it is impossible to prevent the lumber men working in the neighbourhood from poaching on Sundays.

The club has three well-managed club-houses, situate respectively on Little Moose, Bisby and Catigana Lakes, besides several small camps in outlying districts, with cooking utensils, &c., for use of members.

Members and their friends may not kill more than twenty-one brook and five lake trout a day, no brook trout to be taken less than seven inches long (State of New York law limit is six inches). Salmon trout are like the Irish lake trout in shape and colour, seldom rise to the fly, and are taken trolling, or else with live bait gudgeon sunk to the bottom near the shore. Neither means commended itself to my host or self, but as our guide said they were not to be caught with the fly, we tried one morning and one afternoon. On Saturday evening, towards dusk, we caught five good fish on live bait, averaging $2\frac{1}{2}$ lbs. As the snow had only melted a week before, the brooks were full of logs, so our fishing was confined to the lakes, where, with the fly, morning and afternoon, we caught fair baskets of brook trout from $\frac{1}{4}$ lb. to 1 lb. in weight, but did not reach the limit any day.

On Lake Panther, which had 25,000 ouananische planted out the year before, we hooked many of these game fish, running from seven to nine inches; these of course were replaced. The club is making the experiment of trying to introduce this fish into their waters, but previous experience with small numbers in another lake

was, that when about four years old they disappeared, and were heard of as being caught in the Large Moosi and Delaware Rivers, but not afterwards.

We only fished Saturday, Monday and Tuesday forenoon, returning to New York.

The Adirondack district has an altitude of between 2,000 and 3,000 feet, consequently no very high mountains, is well-wooded, but not fertile, has numerous chains of lakes, some connected by rivers, others not; this district, until Maine was exploited and the railway built, was the "happy hunting ground" of New Yorkers and others, who liked the free life of the woods, and either built themselves log huts, or camped on the shore of some lake in tents.

Besides fishing, in the late autumn there is deer (Virginia) shooting, either stalking or else still hunting, *i.e.*, lying waiting in a boat on the lakes till they come down to water. Driving or hound hunting is not allowed by State Law.

My second visit was in July; the fish are much shyer and scarcer, and seek the depths of the lakes and what are called the spring holes in the river, but the woods and lakes are beautiful, the club-houses are nearly filled and the various camps on the shores are filled with young and old, up to escape the heat and on pleasure bent. There are fishing and boating picnics, camp fires, and impromptu dances with attendant flirtations.

My host asked me if I would go for a week's tramp to the southern boundary of the club, fishing when we could, or staying on if there seemed a good supply. It was a most enjoyable tramp, but baskets were small, though I think we did the record catch in the month for size, as my host caught a brook trout, weight $2\frac{1}{4}$ lbs., and I caught his mate, $2\frac{1}{4}$ lbs., in the same pool, on a brown hackle. We saw numerous deer and some fine heads just clearing their velvet.

The best of times had to come to an end, and I sailed for Bermuda and the hottest part of the hot weather on July 21st, 1899, and it has been beastly, with a hurricane thrown in. Still there remains the happy thought that in any case I had had the best of times for three months.

Echoes from the Past.

NOTES ON A MEDICO-MILITARY ROMAN REMAIN.

BY LIEUTENANT-COLONEL R. H. FIRTH.

Royal Army Medical Corps.

IN an interesting historical retrospect of the army surgeon in Britain, prior to the sixteenth century, which Captain Howell contributed to this Journal (vol. i., p. 111), he mentions the existence of a stone or tablet, found at Housesteads in Northumberland, evidently to the memory of a medical officer of a Roman cohort, doing duty in defence of Hadrian's Wall, which extended from the Solway to the Tyne. Recently, while looking through the papers of a deceased friend, I came across a fairly well-preserved rubbing as well as an excellent sketch of this very stone. From inquiries which I have made, it is interesting to know that the stone is still in good preservation, and in the safe keeping of the Society of Antiquaries of Newcastle-upon-Tyne, being exhibit No. 188 on the north portion of the east wall of the museum in the Black Gate of the castle in that city. From a memorandum attached to the rubbing and bearing date 1841, it appears that this stone belonged formerly to the extensive collection of a certain Mr. George Gibson, and was brought from Housesteads in the year 1813. Housesteads yielded a peculiarly rich find of altars and other remains of the Roman occupation, being the site of the military post Borcovicus, which was the seventh from the Tyne, and the eleventh post from the Solway end of the great wall. The spot is apparently identical, in the present day, with the small town of Haltwhistle on the Newcastle and Carlisle line.

The monumental tablet is a stone measuring five feet and a half by two feet and a half. The inscription, in letters nearly three inches in height, may be expanded into the words: "*Diis Manibus, Anicio Ingenuo medico ordinario Cohortis Primæ Tungrorum vixit annos viginti quinque.*" The animal on the upper part under a semicircular wreath is a rabbit or hare. These animals were emblematical of Spain and Sicily, either of which countries might have been the birthplace of this young officer. The Tungrians formed a part of the Roman auxiliaries who served in Britain under Agricola; some historians refer to them as Belgian Gauls, but Tacitus refers to their geographical position in the words: "*qui*

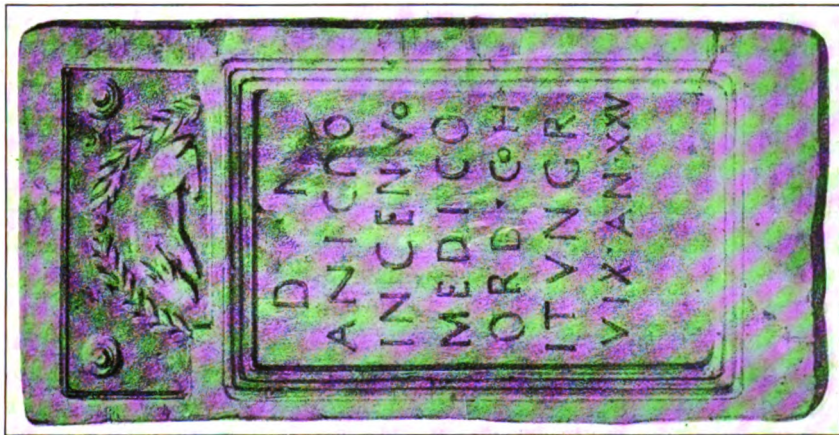


FIG. 1.

To illustrate article by Lieut.-Colonel R. H. FIRTH, R.A.M.C.



FIG. 2.

primi Rhenum transgressi Gallos expulerint, nunc Tungri nunc Germani vocati sunt," from which it is legitimate to infer that they were Teutons. The first cohort of Tungrians was attached to the ninth legion, which was employed in the reigns of Vespasian and Domitian in Scotland to overcome the Caledonians and, according to Tacitus, played a conspicuous part in the hard-earned victory which Agricola obtained over Galgacus in the Grampians.

An excellent engraving of this stone is given, I believe, in *Archæologia Æliana*, vol. xii., p. 85, but I have not been able to verify the reference; mention, too, is made of the stone by Hodgson in his "History of Northumberland," while the Society of Antiquaries of Newcastle have details recorded in their Transactions. As these various records are not readily available to all, it has occurred to me that the present opportunity should not be missed of reproducing in our Corps Journal the accompanying illustrations of this remarkable Roman remain, so peculiarly interesting to ourselves. One (fig. 1) is a copy of the drawing which has recently come into my hands, the other (fig. 2) is from a photograph taken of this stone as it now exists in the Newcastle Museum; for this latter I am indebted to Mr. Robert Blair, F.S.A., Secretary of the Society of Antiquaries of Newcastle-upon-Tyne, to whom for his courtesy and kindly interest in my inquiries I am under considerable obligation.



Abstract.

ON THE CAUSES OF FAILURE IN THE TREATMENT OF GONORRHOEA.

(*Abstract of a Clinical Lecture by PROFESSOR E. FINGER*).¹

OUR views as to the proper treatment of this disease have been entirely changed, owing to the advance during the last few years in our knowledge of the etiology and pathology of gonorrhœa. Formerly the condition was regarded as a catarrh of the urethra, hence astringent and sedative treatment was adopted. In the then state of our knowledge this treatment was perfectly correct. Now, however, knowing that the disease is caused by the gonococcus, a totally different line of treatment is indicated.

Let us consider, for instance, the case of an ordinary acute gonorrhœa, *i.e.*, an acute anterior urethritis caused by the gonococcus. What happens is this: the gonococcus gains a footing in the mucous membrane close to the meatus. Day by day the colony extends, spreading over the surface like a scum and also penetrating the epithelium. The longer the process is allowed to continue undisturbed the firmer the hold it gets upon the parts. How, then, can an expectant treatment be justified? The proper treatment is obviously to destroy the gonococcus which is causing the disease. The new antiseptic preparations, such as protargol, largin, &c., place in our hands a ready means of destroying the gonococcus.

Again, our view as to what constitutes a cure in the disease has been materially altered. Knowing as we do that the gonococcus in time penetrates deeply into the epithelium and lodges in the glands, the mere fact that the visible discharge has ceased is no proof that the disease has been eradicated. On the other hand, let me warn you against a too prolonged treatment, as the irritation caused by the repeated injection of these drugs may keep up a catarrhal condition of the mucous membrane and so prolong the discharge.

In order to be certain that the disease has been cured we must make repeated microscopical examinations of the discharge or of the urine, should this be turbid or contain threads, in search of the gonococcus; the latter soon disintegrates in the urine, hence the specimens should be fresh. Another point to which I should like to draw your attention is that syringes of small capacity, such as are commonly sold for the treatment of this disease, do not contain sufficient fluid to distend the mucous membrane of the urethra, and are useless for the purpose for which they are sold. Again, the injection should be made at least once in each of the eight hours of the day, and always the last thing before retiring to rest, and the first thing on rising in the morning.

¹ *Wiener Klinische Rundschau*, April 24th and May 1st, 1904.

As regards exercise, it is a common practice to advise patients to take as little exercise as possible. The result is—in private practice, at any rate—that a patient who is obliged to get about, instead of walking, takes his seat in, say, an omnibus or other public conveyance, in which, owing to the jolting, the perineum is subjected to considerable pressure and irritation. This, obviously, is very much more harmful to the patient than walking. Gentle walking is in effect the least harmful form of exercise which the gonorrhœal patient can take.

Another point which I wish to emphasise is this: that patients are commonly advised to spend as long a time as possible in bed. Now while in bed the patient, having nothing to do, naturally takes to reading to pass the time, and also selects, as a rule, the most interesting literature he can lay his hands on—frequently a French novel. The result of this and the warmth of the body promoted by lying in bed tend to cause a state of congestion of the genital organs. This condition is one of the most harmful, as regards cure of the disease; in fact, in my opinion, it almost renders treatment futile. Consequently I do not recommend that patients should spend more than the usual number of hours in bed.

Patients sometimes come to me and say that so long as the injection is continued there is no discharge, but on leaving off the injection for a few days the discharge reappears. This merely indicates that the disease has attacked the posterior urethra, which it does in 80 to 90 per cent. of the cases which last more than two or three weeks. To ascertain if this exists the "two glass test" should be used; when the first and second urines are cloudy, posterior urethritis definitely exists, but when the second urine is clear, this does not exclude a slight degree of posterior urethritis. Should this condition be suspected the anterior urethra should first be washed out with some mild antiseptic solution, and the "two glass test" applied immediately afterwards. If the first urine is cloudy the posterior urethra is certainly affected. Failure to detect the presence of posterior urethritis is the cause of failure of treatment in many cases. It may also be remarked that gonorrhœal rheumatism only occurs in cases in which the posterior urethra has been infected.

Gonorrhœal Prostatitis.—This condition accounts for many cases of so-called latent gonorrhœa—that is to say, of gonorrhœa which has apparently been cured, but which reappears on some irritation. Gonorrhœal prostatitis is also responsible for the complaint known as non-gonorrhœal epididymitis (*epididymite d'emblée*). Again, this latent gonorrhœa, although but slightly virulent, is still sufficiently so to infect the wife, and thus lead to serious consequences.

Before concluding let me impress on you the great importance of directing your attention to the condition of the posterior urethra and of the prostate in regard to prognosis. Should the practitioner fail to recognise the presence of the gonococcus in these parts the consequences may be serious to the patient and unpleasant for himself.

C. E. POLLOCK.

REPORT OF THE ROYAL COMMISSION ON THE WAR IN SOUTH AFRICA.

As the actual volumes of this important report are unlikely to be accessible to the majority of members of our Corps, while the evidence contained in their pages cannot fail to be of interest to our readers, we propose giving a *précis* of the evidence so far as it relates to medical organisation before and during the late campaign. For this summary, which is continued from p. 562, vol. iii., we are indebted to Lieutenant-Colonel Edwin Fairland. It deals mainly with evidence regarding medical equipment.

Sir Frederick Treves, Bart., C.B., K.C.V.O., F.R.C.S., called and examined :

(Q. 11,906.) I was with the Ladysmith relief column from the time it started until the relief of Ladysmith, and as Consulting-Surgeon was present at all the operations for the relief. Afterwards I was invalided home.

(Q. 11,971.) You mention that the A.M.S. suffers from over-organisation? That is perhaps the most striking fault in it. It is very elaborately over-organised; almost strangled by the mechanical elements introduced into it. Its administration has been elaborated to such a degree that it is almost unworkable as it stands on paper. I think the success of the work in Natal depended upon the fact that the military medical organisation was entirely thrown aside.

(Q. 11,972.) Would you explain exactly what you mean by its being so organised as to be practically strangled? By the immense amount of detail to be carried out in obtaining transport and equipment in moving, the enormous number of forms to be dealt with to obtain what is necessary, and, in fact, if in the rapid moving of a column the positive instructions were carried out the hospital would be paralysed, it would be impossible to keep on its work. The length of time taken to obtain the supplies and transport would be such as to paralyse its movement.

(Q. 11,973.) But, as a matter of fact, were all those forms of organisation pressed? I think I may say, with regard to our particular column, that they were suppressed, and the General simply said, "You want so many bearers, get them."

(Q. 11,975.) Of course, the organisation that may have been proper for an Army at home would not be applicable in the field? No, it is not suitable for work in the field. It is full of an enormous number of safeguards apparently based upon the impression that the officer in charge of a hospital is likely to be incapable, and that his incapacity will be minimised by restrictions of all sorts.

(Q. 11,976.) You mean principally financial? No, it is more a question of supplies and the possibility of independent movement. In an Army on a peace footing at home it might be a suitable form of organisation; it is, however, very laborious, and puts an enormous amount of work upon men. It is an exceedingly extravagant service; it is worked in the most costly way possible. You obtain an officer who is supposed to be a specially qualified man, who receives high pay, and charge pay; and then he is put to do work which is practically much better done by an ordinary clerk for a pound or so a week I would say this, that if a man is good enough to be put in charge of a large mobile field hospital, that man should be regarded as responsible, and should have, to a very large extent, perfectly free action. As a matter of fact, he is not free in any particular. Of course, his time of marching and his route, and so on, must be determined by the General, but the place of pitching the tents and the question of food, water, and other supplies, and his transport and his general outfit, depend upon conditions over which he has practically no control; he becomes a machine, and there is no credit in working the hospital well.

(Q. 11,986.) As to food, for instance, I suppose that is entirely under the Army Service Corps, is it not? Yes, it is, but still there is the question of controlling supplies better than we could. For instance, after the battle of Spion Kop we had 715 wounded down after dark, and we had to pick out all the slightly wounded cases next day, and send them away because we could not feed them. The seriously injured had to be left, the little injuries had to be got out of the place because we had no means of feeding another 700 people. The answer to that would be that the officer in charge of the hospital was so hampered by the restrictions of the Service that he had no free hand in the matter.

(Q. 11,987.) You do not suppose that if the officer had had a free hand he could have brought up the food? There was a large food park close by, and there was no difficulty except in the process of getting it.

(Q. 11,988.) He could not exercise any authority in order to get it, is that your point? That is my point, and the practical outcome of it is this: that we had to spend one day in getting the trifling cases away, because we could not dispose of them. . . . The supplies were admirably managed, I could not say too much for the most excellent way in which the supplies were managed; it was splendid.

(Q. 11,990.) Would there not be a danger of interfering with that efficiency if you split up the responsibility? I do not think it is so much a question of responsibility; it is a question of not being able to get things without an amount of form which is almost disastrous. . . . The man who is put at the head of the field hospital practically can have nothing to do with the sick. You get a first-class surgeon or physician, but his time is spent in looking after accounts and tallies and arrangements of that sort. We had an exceedingly good officer as the Surgeon-in-Charge

of the hospital I was in, but he could have little to do with the sick. He was engaged as a superior kind of clerk looking after accounts. If we sent down 150 men with perhaps twelve bearers to each stretcher, and we had twenty-six miles to cover, all those stretchers had to be accounted for, blankets and everything, and it is a very heavy piece of work. . . . In a civil hospital it would be preposterous to suggest that the senior surgeon should be answerable for blankets and all those things. At the great hospital of Maritzburg at Fort Napier, one of the best medical officers as a medical man never saw a patient, he was entirely engaged in office work. . . . Then as to the field hospital, its equipment is based upon certain tabulated forms, and is supposed to be quite complete in itself; and the result is that in the many journeys we had to make in Natal up to the Tugela and back again, we were dragging with us what amounted to tons of useless material. The outfit of the field hospital is suitable for any climate in the world, from the Polar regions to the Equator, and it has to be dragged all over the country.

(Q. 11,999.) Would it have been impossible for them, at the suggestion of the Surgeon-in-Charge, to have left many of these things behind? He would have to account for them, and the question is, where are they to be left? To leave stores on the line of march means a guard, and difficulties of that sort.

(Q. 12,000.) But they might have been eliminated from the beginning if they were intended for the Polar regions? Well, there is a stereotyped outfit for a field hospital, or for a stationary hospital, or any kind of hospital, and that outfit has to be absolutely complete to the smallest detail; and that has to be dragged all over the country, whether it is wanted or not. I suppose I should not be using any exaggeration if I said we could have thrown away quite half our outfit, and not missed it.

(Q. 12,001.) Of course we must bear in mind that there is no more common accusation against a Government Department than that something is deficient which ought to have been there? I know.

(Q. 12,003.) Do you think any senior medical officer ever represented to a Commanding Officer in the field that it was his desire to leave certain things, and was told he must not? I do not think so. I do not think such an idea would ever enter his mind.

(Q. 12,004.) Could you indicate some of the things which could have been left behind without any risk? There was a very large number of boxes of drugs which never could be required and were never opened, but had to be dragged about.

(Q. 12,007.) If they were drugs which could not be used, surely there was no advantage in sending them all the way to South Africa? That is my contention; but they were sent, and were attached to the field hospital, and we had to take them about.

(Q. 12,010.) I suppose it is all laid down by regulations what is to be sent, and what is not? Yes. . . . The whole difficulty could be got

over by having advanced medicine depôts, in charge of a quartermaster. If with every column there was one, and if the mobile field hospitals took from it what supplies they needed, that would get over the difficulty. At present they have no choice in the matter, they must take the whole complete outfit. If my suggestion were carried out you could say to the officer in charge of a hospital: "Take from this advanced medical dépôt what things you want; you are responsible for the efficiency of that hospital, and if you are lacking in anything it is entirely your own fault." There was a very large dépôt at Durban which was admirably administered, and we had a dépôt with us, but it was practically no use, because we had a complete outfit. It would have been very much better if the dépôt had been trebled and we could have been cut down by two-thirds. We had to move and the dépôt had not. When the dépôt moved into Ladysmith of course it was of immense service.

(Q. 12,016.) About collecting and dressing stations, what is your suggestion? I think this war has shown that the system of breaking up the collection of sick into two stations, collecting and dressing stations, is no longer needed. It is cumbrous, and as a matter of fact was not carried out.

(Q. 12,017.) What does it exactly mean? It means that the men who are picked up from the firing line are brought down to the collecting station, which has a certain outfit, and from there are taken by an arranged route to the dressing station, where certain dressing operations are carried out. The dressing station is supposed to be out of the line of fire, but with the small Boer bullets that means that it is a long way off. From these they are taken in ambulances to the field hospitals, which will be certainly out of the line of fire. To individualise those two stations was next to impossible.

(Q. 12,022.) What is done by the medical officer at a collecting station? He would deal with any extremely pressing thing, the putting on of a first dressing, which is inside the man's tunic, and tabulating the injury by means of a label. That is really essential, because in one or two instances the label was lost, and a man died, and there were no means of finding out who he was as his clothes had all gone. Several men were buried and no one could identify them; besides, it saves the man from being pulled about twice. The dressing station may be spoken of as something a little more than first-aid.

(Q. 12,023.) As to Bearer Companies? The Bearer Company is separate from the field hospital, and that is another system which is a little cumbrous. It would be much better if the Bearer Company were a part of the field hospital, and could work under the instructions of the officer in charge of that hospital. . . . The Bearer Company is a certain unit: so many men, so many horses or mules, and so many carts, a water cart, and a certain number of A.S.C. men are attached to the company. Their duty is carrying the sick back from the dressing

station to the field hospital, and also taking charge of a certain number of sick. A Bearer Company can pose as a little temporary hospital for a time. It would make it very simple if the Bearer Company were associated with the field hospital; they have to work together, and they would be controlled by the medical officer in charge of the field hospital, who will be a man of the rank of Colonel.

(Q. 12,035.) Your next point is that a large mobile field hospital should move with each column? That point was simply this: The gravest thing in the treatment of the wounded in war is the transport; the number of lives lost by unsuitable transport and the number of people crippled by it, is inevitably large. Say that a man is shot through the thigh, if he could only lie where he was shot he would do very well; but if he has to be lifted into an ambulance and jolted ten or twelve miles his prospects are very small. There is no doubt whatever that the mortality of a war is very largely increased by inefficient transport. The experiment was tried in Natal of having at the head of the column a large field hospital, to which I was attached, and it was an unqualified success. That was the first time it was ever employed. The cases came straight from the very ground into our tents; we were always pitched as far up as we could get, next to General Buller; as a matter of fact, we could be present at an engagement, we knew where the different regiments were, and we often knew at what range the man was shot, and he was brought into the tent direct. It was of immense service, and practically the whole of the wounded in Natal came through that field hospital, and therefore had first class treatment as soon as it could be got. A field hospital could keep up with a column at the ordinary Infantry rate. Bad cases must, of course, be left, but if you had a big field hospital you could keep them. We kept our very badly wounded after Spion Kop. If we had not have had that big hospital those men would all have gone down, and a good many limbs would have been lost by transporting them at an unfortunate time . . . it is the dragging of the man about that kills him. . . . The transport is the weakest thing in the A.M.S., it seems to me . . . an English ambulance is hardly fit to transport the sick, it is almost impossible for a well man to sit in it when it is moving rapidly. If you want a waggon that can be driven at a trot over a series of walls, or practically over churchyards, and that will come out unbroken, the English ambulance will do it, but it is a rough affair. Given a good road it is all right and can carry a good number; but evidence was given in favour of light carts, such as the Indian two-wheeled tonga. They are the best for rough ground. . . . I would urge this, that there is no other provision than this, an ambulance that can go only on a road. That is the point.

(Q. 12,052.) The evidence was that Mark V. stood the work across country? Yes, but the patients did not. It is the weight and rigidity of the cart which is the bad feature of it. . . . I think you want the

two kinds of conveyance always, the light one to gallop across country to pick up a man, where you could not take a heavy lumbering waggon with six or eight mules. . . . There is no equipment in the Service for following a Cavalry Column. It must be a two-wheeled cart, the orderlies must be mounted, and a saddle ought to be provided so that a sick man could be brought home on a horse.

(Q. 12,059.) Speaking generally, you would say the medical work was well done? Admirably done, and Mr. Brodrick's Committee has rectified most of the faults that were apparent to us.

(Q. 12,061.) You are still serving on the Advisory Board? What sort of questions do you go into? Well, into all such questions as I have been indicating to-day.

(Q. 12,064.) Is it optional with the Director-General to accept the Board's recommendations? Our communications go to the Secretary of State.

(Q. 12,065.) What is your precise procedure; what do you do? Practically any matter which is a question of opinion comes before the Advisory Board; for instance, the recommendations of all men for promotion; that goes, as you know, before another Board, who may or may not accept the recommendations. . . . At present the work of the Board has been devoted mainly to improving the terms of the Service and obtaining men for it, because it has been so terribly undermanned; and in establishing a Medical Staff College in London, and the like . . . we have just inspected twenty-two military hospitals.

(Q. 12,076.) Do you find that the Secretary of State carries out your recommendations? Wonderfully well. The Secretary of State supports them in every conceivable way. Mr. Brodrick has constantly expressed his wish at any sacrifice to get the best Medical Service that can be got.

(Q. 12,080.) Had you any experience of Civil Surgeons sent out to supplement the men of the Army Medical Corps? Yes. The field hospital I was attached to was worked mainly by Civil Surgeons.

(Q. 12,081.) Had you any fault to find with the way in which the Civil Surgeons were selected in England? So far as my own knowledge went, none; the men we had with us were splendid.

(Q. 12,085.) And you employed in the Medical Department a large number of subordinates who were picked up on the spot, I suppose? Bearers, and of course conductors; the conductors were all local men.

(Q. 12,086.) Had you any nurses with the force that was with you? It was the only field hospital that took nurses. I obtained permission from General Buller to take up two.

(Q. 12,087.) Were those the only nurses with your force at Colenso and in those operations? At Colenso, but some others came up later. The idea was that a wounded man should have as good attention on the veldt as he would have in London, and the War Office for that purpose gave me an exceedingly elaborate outfit; they gave me a couple of

waggon, sixteen mules, a horse, a man, a conductor and six Kaffir boys so that in any case for any serious operation I could have been there. . . . All the nurses were carefully picked women, and no woman so far as I know was engaged who had had less than three years' training.

(Q. 12,091.) With regard to the Bearer Company, which, as you say, is a military unit, being under the officer in charge of the field hospital, would not the duty of the Bearer Company very often be very far from the field hospital, and would the officer in charge of the hospital, which presumably is in rear of the Army, know exactly where to send them? I think so. In one case the Bearer Company saw nothing, and no wounded came near them; they were badly placed, but it was a piece of fortune.

(Q. 12,092.) Is there any officer of intelligence in charge of the Bearer Company who would quickly pick up the knowledge of which direction they should go to find wounded? He would have to act on the instructions. The man in charge would probably be a Major. A good deal would have to be left to his discretion.

(Q. 12,094.) I have no doubt you are aware that great efforts have been made for many years, both in India and in England, to improve the ambulance carts, but I gather from you that these efforts have not, so far, been very successful, and you think they have not found a very efficient cart? No, in Natal we had nothing but Mark V., which is admirably suited for a road in England, but not for going over a donga and in and out of a spruit, and the like.

(Q. 12,098.) I suppose there is no more comfortable thing for a wounded man's accommodation than a dhoolie, because a man can sleep in it? There is nothing like it; there is nothing in the world like a hand carriage for a wounded man, and nothing ever will be invented as good as that. But it involves an enormous number of men. We had twelve men to a stretcher for the long distances; the weather was very hot, the distance was twenty-six miles, and the country rough.

(Q. 12,106.) You spoke of a mobile field hospital of a large class, would not that necessitate moving the wounded with that hospital as the hospital moves? Well, the point is this, an ordinary field hospital has a maximum capacity for 100; after an engagement like Spion Kop it could not possibly deal with that number (of wounded) and they would have to be sent down unless you multiplied field hospitals indefinitely. The hospital I speak of is a large mobile field hospital with a big equipment and capable of great expansion. Before the battle of Spion Kop we had a direct instruction to put up 100 tents; that was the only hint given that there was to be an engagement, and that enabled us to take in 500 wounded men. Now a field hospital could hardly do that.

(Q. 12,107.) My point is this; if the wounded men are to be moved, would it not be better to move them at once to the rear, where they would remain altogether without further movement? No, I do not think so. We saved a good many lives on that particular occasion by keeping them until they were fit to move.

(Q. 12,108.) Now take the case of Lord Roberts' advance on Bloemfontein, or on Pretoria afterwards, there the mobile field hospital would move as he moved, that would necessitate the movement of the wounded too? Yes; but on such a long movement this bigger hospital I speak of, would be very much nearer the head of the Column than the next base hospital would be. The longer a man can be kept near where he is shot the better; transport is bad, and the later that it can be undertaken the better.

(Q. 12,111.) We heard from Dr. Fripp that the Advisory Board visited the military hospitals at Aldershot, Netley, York, Portsmouth and Gosport. Did you visit those hospitals? Yes, we visited twenty-two altogether.

(Q. 12,112.) He seems to have found a great deal in those hospitals that needed amendment, and he said that it would take a considerable sum of money to put them in the state they ought to be in; what amount do you think ought to be applied for that purpose? I have really no means of forming an estimate beyond saying this, that there is a very obvious need of an immense outlay in connection with our military hospitals, which are not up to the mark in any way whatever.

(Q. 12,113.) He instanced one case at Aldershot where the hospital had a portion on one side of the road and a portion on the other? That is the 3rd Station Hospital; it is not fit to be a hospital. The military hospitals do not come up to the standard of a workhouse infirmary, and they ought to be at least brought up to that level.

(Q. 12,114.) That is one of the objects, I suppose, of this Advisory Board you are sitting upon? Yes; we will be sending in within a month our report to the Secretary of State on the twenty-two large military hospitals in this country, that is to say, hospitals with over 100 beds.

(Q. 12,115.) We have had a gentleman before us here who stated that in Russia they took into the large military hospitals such of the civil population as chose to go, in order that the medical men might really have sufficient practice to enable them to discharge their duties, in fact to teach them; would you approve of that being done here? No, it would never do in this country, I am certain. We are making elaborate arrangements to keep the Military Medical Officer up to his work by a system of examinations, where a man can only get his advancement by professional ability, by establishing a military staff college, to which he will return from time to time to carry out special branches of the work, and by closely-associating ourselves with the civil hospitals, by having civilian teachers, and endeavouring in every way to induce the military officer to go back to his civilian hospital from time to time, and special leave will be given for that purpose.

(Q. 12,117.) But you do not approve of admitting the civil population to the military hospitals? I do not think it would answer. It opens up a series of complicated questions; it practically opens up the

question of a State-supported hospital (and we have no such thing in this country) such as they have in Germany and other parts of Europe, and I think the difficulties would be very considerable.

(Q. 12,118.) Is there any reason why a military hospital, a base hospital, during the time of war should not be conducted exactly on the same lines as a large London hospital? It could be on the same lines if the question of discipline be introduced.

(Q. 12,119.) I mean with respect to the work that the medical men have to do? It should be exactly the same.

(Q. 12,120.) Medical men in the large London hospitals have nothing to do with clerical work? Nothing whatever.

(Q. 12,121.) Whereas you say that even the head of one of these military hospitals has his whole time taken up with clerical work? With administrative work. The point that strikes us is the extravagance of it.

(Q. 12,122.) The whole of his skill and everything is thrown away? Entirely.

(Q. 12,123.) He is simply doing the work of a quarter-master, a clerk, or a house-steward? The work of a house-steward; it is of course a very extravagant way of doing it.

(Q. 12,125.) Do I understand now that the idea is, under the advice of this Board, that the Army Surgeons will get practical work in civil hospitals during peace time? Do you mean that they will have actual charge of patients?

(Q. 12,126.) Yes, or surgical work? I do not think so as regards the actual charge of patients. They will receive instructions through the civil surgeons and watch the practice.

(Q. 12,128.) They would not perform operations? No, that would not be possible.

(Q. 12,129.) Your Army Surgeon then during peace time gets no practical experience of operating, does he? We are doing all we can to develop that in this way, that if the military hospitals are developed all the military sick will be treated, and none will be sent off to civil hospitals as they are now.

(Q. 12,130.) Take the surgical cases, they will not have many surgical cases in the military hospitals? Take a case of this sort: supposing a private in a cavalry regiment develops a rupture; if that youth is operated upon he can remain in the Service, and that operation ought to be done by the military surgeon; but he will often not do it. He says, "I have got no outfit," and the man is sent off to the civil hospital, is operated upon, and then comes back to the Service again. Our contention is that if the military surgeon undertakes the surgical work that falls within his legitimate sphere, he will have quite enough to keep his hands well in training.

(Q. 12,131.) Still, in the civil hospitals you get cases every day of

broken limbs, accidents, and so forth, that you would not get in the ordinary way in the Army; where would your Army surgeons get their practical experience? There really are more accidents than you would imagine in connection with military life. Take the Cavalry Hospital at Canterbury; the men under training are prone to get concussion of the brain, fractured spines, and fractured limbs, and more than that, such practice as the officers lack would, I hope, be sufficiently made up by a period of study in a civil hospital.

(Q. 12,132 & 3.) Do you see any particular objection to these Army surgeons having practical surgical experience in the civil hospitals for a certain time? I do not think it is possible. You see the hospital has got a certain reputation; the officers are selected with the very greatest care, so that when a patient comes in, instead of having the operation done by the man who has been specially picked to do it, it would be done by the first military officer whose turn it was, and I do not think that would be quite keeping faith with the public. The public would not like it and the hospitals would not meet with the support they at present get.

(Q. 12,135.) With regard to that reference you made to the complete outfits that were sent out under the present regulations, there were a great many things that were unnecessary for the campaign in South Africa, and I take it that there again under this Advisory Board that sort of thing will not be likely to occur in the future? I do not think so. . . . The suggestion I made is this, that with each Column there should be an advanced medical dépôt, the officer should get his outfit from there and the whole test of the efficiency of that hospital would come on his shoulders.

(Q. 12,140.) The chief Army medical men at this end ought to know the nature of the outfit that would be required, should they not? They would, but there is risk of becoming centralised. The officer in charge of the hospital might say, "Well, I think I ought to know better what I want, I have to run this hospital, I would sooner get my own outfit than yours," and I think if the material is landed in South Africa and the man gets his supply from that base, that would be the more simple plan.

(Q. 12,144.) Have you had before you at the Advisory Board the question of providing sanitary officers? Yes, that is now under discussion; many feel very strongly upon it, and it is a most desirable feature.

(Q. 12,145.) We have it in evidence that the supplies furnished for the medical department were of an entirely antiquated character, not in keeping with the requirements of to-day, and with the advance in the science of medicine and surgery; did you find them to be so? Well, it is true, but I do not know whether I should say entirely antiquated, but we were carrying about instruments which I should have thought would only be found in museums. . . . I have been asked to draw up a sketch of an instrument case; and that means changing not one but many

thousands through the length and breadth of this enormous empire, and the outlay is colossal. As soon as these boxes are put all over the world, where the British army extends, there is a change in practice and they become obsolete. . . . To put the Army surgical outfit into first-class condition now the sum would be positively staggering. . . . We took about medicines in bottles in the most cumbrous form, and that had been in them for twenty years possibly, and they were dragged about all over the country, packed up in the most ludicrous and extravagant way. Tabloids would have put the whole outfit into a twelfth part of the space. The present outfit is cumbrous beyond expression. A medical pannier would take two men to lift it, whereas an equal outfit of modern goods could be lifted by one hand.

(Q. 12,154-5.) We have been told that the surgical instruments were inferior to those used in civil life ; and that the system of disinfection was very imperfect ? That is true, too ; sterilisers are not easy to carry about ; nor methylated spirits. We were very short of fuel.

(Q. 12,156.) It has been recommended that the officers should have an opportunity of practising in the civil hospitals in Great Britain and on the Continent ; do you think it desirable ? It is very desirable, but the difficulties are almost insuperable. We are building on the Embankment a large Military Hospital and associated with that will be a Medical Staff College, equipped in the very best possible way ; and we hope to keep the medical officer up to his work by passing him through that hospital and through that Staff College. The possibility is that we shall be able, or shall be allowed, to keep patients in that hospital longer than the Service would permit ; as soon as a man is said to be unfit for service now he leaves it ; but it would be very much better in the interests of the education of the medical officer if a certain number of these disqualified soldiers could be kept under care for a few extra months.

(Q. 12,157.) Is it settled that the new College is to be built on the land at the back of the Tate Gallery ? It is, I think I may say, absolutely settled ; I think permission has been given in the last week. It is definitely settled. The Advisory Board meets at 68, Victoria Street. . . . The young surgeons in the hospitals are accustomed to use the most modern instruments, and see operations performed with them by the ablest men in the profession. If they go to a military hospital they have to use some antiquated instruments.

(Q. 12,168.) Looking at it from the point of view that using these antiquated instruments might cost life or limb, do you not think it would be better that the most recent instruments should be supplied ? Beyond any doubt, if the expense could be met, which would be enormous ; and there are other things almost more pressing, namely, the state of the military hospitals in this country. No one could say that there is any military hospital in this country which can compare with a large work-house infirmary, for instance, and that is a fairly low standard of comfort.

(Q. 12,169.) Do you not think that is rather discreditable, to say the least of it? It is not creditable to the British Army, I must confess.

(Q. 12,170.) Although the instruments were antiquated, the work done was all right? The work was very well done; it was a question of making the best of it, and it was really very well done. The instruments were obsolete; for instance, there was no such thing in the Army as a telephone probe, and to find out a modern bullet with anything else is often not practicable. By the time the entire Service is fitted with telephone probes, something better will have come in, probably.

(Q. 12,172.) Since you have been on the Advisory Board have you found any evidence to show that in England the Army Medical people know anything about the A.M.C. in Russia and Austria? Unfortunately they do not, and we are making a special point of this, that before a man can be promoted to a Colonel, he must possess a knowledge of the military service of certain countries. The subject for examination now is an account of the military medical system in France; and that will be further developed, so we shall be prepared to examine the men on the military services in any European or well-civilised country.

(Q. 12,173.) In condemning all the military hospitals in the country, almost, that have been inspected as yet, I suppose it is understood that when they were constructed they were constructed according to the best knowledge of the day; take Aldershot and Netley, for instance, which were constructed about the time of the Crimean War, do you think they are defective, judged by the standard in force then? Well, Netley undoubtedly is; it is faulty in construction, beyond a doubt; and some of these hospitals were built in 1783. The Herbert Hospital at Woolwich is very good indeed, and so is Hounslow in structure—perfect.

(Q. 12,175.) But you were not speaking about structure? I was speaking of what might be called the general standard of comfort in the wards and general outfit. The public would scarcely credit that sick men were kept in casemates; at Chatham they are actually kept in old gun casemates. It was built as a fort, so there is no hospital worth speaking of there.

(Q. 12,177.) Are Netley and the hospitals at Aldershot very defective? I think I am right in saying that out of twenty-two hospitals we looked at on what might be called the military standard, eight might be called good.

(Q. 12,178.) But on the civil standard? There is nothing approaching the civil hospital . . . for instance, it is a small matter, but the shirts and the sheets come back from the laundry dry and that is all; there is no question of ironing them or even putting them through a mangle, and they look like things that have been crumpled up in your hands; now that would not be permitted in a poor law infirmary.

(Q. 12,180.) Dr. Fripp told us there were no means of washing the utensils? That matter is a long way behind. I had to report upon hospitals in which I myself actually witnessed the washing up of all the

plates, dishes, knives and forks, in the sink in which the bedpans were washed out, many of the patients having typhoid fever. It is positively incredible. That applies to two separate hospitals. All our inspections were carried out without notice. The matter you speak of, Sir, is therefore comparatively small. As to the temperature of these hospitals, during the cold weather we could not find a ward up to 50° F., and that is hardly the temperature for a sick man to be living in.

(Q. 12,191.) In Germany and Russia the Army Medical Services have wider experiences in time of peace than ours? The system is perfectly different; in Germany, for instance, a military medical officer is put with his regiment at Bonn, that regiment stops there for possibly fifty years, and that man is allowed to practise; and in Russia the best surgeons are military surgeons. In England the military medical officer is not allowed to practise. . . . In India he can practise. There is nothing that keeps a man better in form than the test of civil practise, which, of course, is denied to all the men in our Service.

(Q. 12,195.) Would you advocate allowing an Army medical officer to practise? It is not possible, the amount of foreign service is so enormous and his stay in any town so very short.

(Q. 12,198.) In India is it your opinion that he ought to be allowed to practise? It rather suggests this, that he has not enough to do in the Service if he is allowed to practise. What would be the perfect development, if this country were rich enough, would be to allow the treatment of the women and children in the Army. That is not done, and that enormous advantage is lost to the Army medical officer.

(Q. 12,199.) How are they treated? By the civilian practitioners. Take any women's hospital you like, there are a number of cases requiring operation, and it would be of great service if those operations could be undertaken by the medical officer, but there is no accommodation and they go to the civil hospital. The women and children attached to the British Army are looked after practically by civilians. The only women's hospitals are lying-in hospitals, simply because no civil hospital will take in what is called a lying-in case. . . . The moment a woman has anything the matter with her requiring definite treatment she is sent off to the civil hospital.

(Q. 12,201.) If a soldier is going to be operated upon is it now optional for him to be operated upon in the military hospital or in the civil hospital? It depends upon what the hospital is. There is a large one at Canterbury dealing with a number of cavalry men, and there is no surgical equipment in the place. . . . There is no operating theatre, no suitable instruments, and he is therefore sent away; there is nothing in the place at all except the four walls and the beds. If anything happens there, if a man meets with a bad accident, it is so much the worse for the man, as there is no proper outfit in the hospital. There are hospitals of over 200 beds

with no surgical outfit, so that it cannot be said that the military surgeon is encouraged in the Service.

(Q. 12,203.) Are you certain that the women and children belonging to the regiments in India are not treated by the military surgeons? I am not speaking of India, but of this country. We have examined all the women's hospitals in Great Britain, and in every case there is practically only provision for lying-in cases, and of the women and children some are treated as out-patients, but all the rest are sent to civil hospitals.

(Q. 12,204.) Has that always been the practice? Always, since we could find out.

End of Sir F. Treves' evidence.

(To be continued.)



Reviews.

MEDICAL HINTS ON EGYPT AS A WINTER RESORT, WITH A SHORT ACCOUNT OF HELOUAN AND ITS SULPHUR BATHS. By A. J. M. Bentley, M.D. 42 pp., price 1s. (Bale, Sons and Danielsson.)

This well-printed little pamphlet has already reached its sixth edition, and is illustrated with photographs and a map. The author very properly points out to visitors the necessity of obtaining local medical advice upon the manner of life they are to lead when they first reach Egypt, and among the most useful paragraphs are those which describe the medical cases which are suitable and unsuitable for the Egyptian desert; and again, those which give the dress requirements for tourists of both sexes. But if the hints are intended, as we suppose, to be brought up to date, it is a pity that the "calendar of principal events" has been copied from an almanack now seven years old. We see that Dr. Bentley describes himself as a physician at Tewfik Palace Hotel, Helouan, but we do not notice any reference to the other hotels and *pensions* there, yet the pamphlet, so far as it goes, will be useful to intending visitors.

F. M. S.

Current Literature.

A Case of Habitual Vomiting.—This affection rarely occurs in males except as a symptom of organic disease. It is characterised by the ease with which the act is accomplished, its independence of the quantity and nature of the food, the indifference exhibited by the patient and the slight disturbance of nutrition. It is sometimes associated with hysteria or neurasthenia; but when these and other disorders can be excluded the complaint must be regarded as idiopathic. A case of this kind is reported (*D. Militärärztliche Zeitschrift*, May, 1904), by Staff-Surgeon Major Ramsperger of Ulm. The patient, a rifleman, aged 22, a gardener by trade, had been in good health until the present illness. While at school vomiting had occurred every few days; during the last four years the complaint had become worse; vomiting unattended by nausea or retching took place sooner or later after eating; after a full meal, six or eight attacks would occur, especially if he returned to his work. There was an almost constant feeling of pressure in the gastric region, increased by food and stooping, but ceasing after vomiting. The appetite was always good, the bowels somewhat confined.

After admission as a recruit the man endeavoured to conceal his ailment by swallowing the regurgitated food or getting rid of it without attracting any notice. On coming to hospital his condition was as follows: A strongly built man, 5 ft. 8½ ins. in height, weight 154 lbs., somewhat pale, fairly well nourished. Thickening of both inferior turbinates, impeding nasal breathing. Tongue clean, no fœtor of breath, teeth good, organs of thorax sound. The ensiform process eight c.m. long, tapering to a point and elastic at its free end. Some tenderness in the gastric region; no other abnormality. Vomiting occurring several times, about a quarter of an hour after taking food, especially when fluids are swallowed with bread, meat and the like; the act quite involuntary, rapid, noiseless and without any effort. Perhaps a mouthful thrown up at a time, the fragments just as swallowed. From eighteen to thirty-four attacks noticed in twenty-four hours. In spite of these the state of nutrition remained good. The man was discharged as unfit for service.

The unusual length of the ensiform process was a peculiar feature, it could scarcely be regarded as a cause of the vomiting, though an attack could be provoked by stooping after eating. There were no signs of hysteria or other neurosis.

T. P. SMITH.

Unfitness for Military Service Caused by Unskillful Attempts to Remove a Foreign Body.—Injuries to the tympanic membrane and to the tympanum itself are often thus caused. The case (*D. Militärärztliche Zeitschrift*, May, 1904) recorded by Staff-Surgeon Hölscher of Ulm, is especially interesting owing to the length of time that the foreign body remained in the meatus.

A recruit stated that he was quite deaf on the right side. On examination with the speculum a hard substance coated with cerumen was seen

to block up the meatus ; it was removed by the aid of a hook without any injury to the canal, and was found to be a small snail shell, about 10 m.m. in its longest diameter. After removal of some crusts the tympanic membrane was found to be represented by a narrow border ; the ossicles were absent, there was no sign of suppuration. A tuning-fork applied to the left side of the skull, the left meatus being closed, was more distinctly heard on that side. On introducing the long tube of Lucas's instrument into the right ear and the short branch into the left, the sound was more distinctly heard by the latter. Neither speech nor tuning-fork C heard by air-conduction on the right side. The account given by the man was that when about eight years old he pushed the shell into the concha. On trying to pull it out the border of the shell broke off and the larger portion slipped into the meatus. His parents attempted to remove it with the corner of a towel and forceps ; a quack used various instruments, causing severe pain and some hæmorrhage. Purulent discharge continued for some time afterwards. Though in other respects quite fit for service, he was disqualified by the unilateral deafness. Similar cases are sometimes due to the clumsiness of surgeons ignorant of otology.

T. P. SMITH.

The Diagnosis and Surgical Treatment of Sinus-Thrombosis due to Middle Ear Suppuration. In the *D. Militärärztliche Zeitschrift* for May, 1904, Staff-Surgeon Meinhold gives a brief summary of the more definite symptoms of this complication and notes of a case. He points out that cedema and tenderness on pressure over the mastoid process facilitate diagnosis, and clearly indicate the proper treatment. But in the absence of these symptoms (and of prominence of the posterior wall of the meatus) headache, giddiness, rigors, vomiting and fever render an operation advisable, unless preliminary paracentesis and free incision into the swollen meatus are followed by reduction of temperature. The antrum should first be opened ; such conditions as granulations, fistulous openings and softening will determine whether it is necessary to open the middle ear and remove the ossicles, or to expose the sigmoid sinus. Marked discolouration of the sinus necessitates incision and removal of contents ; mere puncture is generally useless. It must be remembered that paracentesis and incision into the meatus sometimes relieve the local symptoms and reduce the fever. But any such change of temperature must be distinguished from the oscillations characteristic of pyæmia. Ligatures of the jugular vein is necessary only when inflammation or a hard cord exists.

The notes of the case are as follows : a man was admitted into hospital suffering from acute middle ear suppuration of a severe type. Fever absent ; tympanic membrane greyish-white, softened ; meatus reddened ; no tenderness of mastoid process. A fortnight afterwards the temperature ranged from 39° to 40° C. ; headache was complained of ; no change in mastoid. Paracentesis was performed three times ; no increase of suppuration. No fever for more than a week ; then came a sudden rise in temperature, with headache and giddiness. Opening the antrum was postponed ; several deep incisions were made into the meatus, and leeches were applied, with transient lowering of temperature. Rigors occurred, with extreme oscillations of temperature. Pulse strong, 90 ; pyæmia diagnosed ; Stacke's operation, with skin-grafting. External and anterior

wall of antrum firm and hard; cavity filled with granulations and softened bony fragments, extending to the aditus and to the sinus. The latter freely exposed upwards and downwards; one dark coloured spot (as large as the head of a probe) in its wall; the remainder smooth and normal. The bony wall of the meatus in front of the aditus cut away with the chisel; malleus and incus (both carious) removed. A drop of pus seen to exude from the dark spot in the sinus, which was then freely opened, upwards and downwards, and a tampon applied. Speedy diminution of giddiness and headache. Copious discharge from the sinus, and gradual abatement of fever during twelve days. Tedious growth of epidermis, not completed until four and a half months after the operation.

T. P. SMITH.

The Influence of the Dwelling Place in the Etiology of Diphtheria.

—This subject is discussed by Dr. Kelsch in *Le Caducée*, May 21st, 1904. Much importance has been attributed to such factors as the condition of the subsoil, the dampness of the walls, the density of the population, the neighbourhood of pools and marshes and of collections of filth of various kinds. It is true that all such conditions play a greater or less part in the etiology of many infectious diseases; but Kelsch points out that they have no special share in the causation of diphtheria. Repeated occurrences of the disease in certain houses have been sometimes noticed; and it has been proved in the laboratory that Löffler's bacillus can exist for long periods outside the human body, and under varying conditions of humidity and temperature. But attempts to discover the microbes in the flooring, joists and dust of houses, in which cases have repeatedly occurred, have seldom been successful. Some authorities maintain that the continuance of the disease is due to microbes remaining in the mouths of convalescents; and that the habitation plays only a secondary part, by multiplying the chances of contagion. Innumerable occasions for the dissemination of the microbes and importation of the disease from without are furnished by overcrowding, frequent changes of the inhabitants, and the attendance of children at school. Flügge has gone so far as to deny the existence of any local disposition; and Moritz Wolf says that a "diphtheria house" exists only in the imagination. But failure to discover the microbes does not justify the assertion that they are absent; the methods of investigation may be defective. Moreover, Flügge and Wolf's theory will not explain the recurrence, perhaps several times, of the disease in houses disinfected and left empty after the first outbreak, and then occupied by the former tenants, or perhaps by newcomers, not previously exposed to contagion. Kelsch thinks that in a large number of cases, a local origin is indisputable. It is highly probable that cracks and fissures in the flooring, and damp joists saturated with organic matter, should maintain the existence and activity of the microbes. Outbreaks of the disease, previously common, have ceased after repairs of defective portions of a house. With regard to such contributing factors as accumulations of filth, the escape of sewer gas and the like, these do not appear to increase the virulence of the microbes, but rather to lessen the resisting powers of the human organism. Possible contamination of the drinking water must not be forgotten. The best water is found in localities free from diphtheria; the worst in those where the disease is most common.

Dr. Granjux, the editor of *Le Caducée*, lays great stress on the importance of the habitation in the causation of diphtheria. He points out that 900 cases of the disease occurred in the French Army during 1901, as against 455, 392, and 377 in the three previous years. The increase was due to the exceptional frequency of the disease in the 11th Army Corps, in which there were 329 cases. The barracks in Tours and Poitiers were especially affected in 1900; and in view of the vitality of the microbes and their power of resisting disinfectants, it was only to be expected that the arrival of young soldiers in the following year would be marked by a fresh outbreak. These fears were soon realised; in Tours there were 164 cases, in Poitiers 134. A similar report came from Bourges. Granjux emphatically expresses his belief that *le casernement c'est l'ennemi*. The dangerous parts of the barrack-rooms are not the walls, which are often whitewashed, but the worn-out floors, spongy to the joists, which become fertile culture-media. The facts may be summed up by the words: *Le plancher c'est l'ennemi*. T. P. SMITH.

Experiments with Colouring Materials as Remedies for Trypanosomiasis.—The *Berlin. Klin. Wochenschrift*, 1904, Nos. 13 and 14, contains an article on this subject by P. Ehrlich and K. Shiga, which has been reprinted in pamphlet form. The experiments were carried on in the Institute of Experimental Therapeutics at Frankfort.

After alluding to the importance of trypanosomes as the causes of sleeping sickness and of tropical diseases of animals, the writers point out that the higher organised protozoa which have gained access to animals bodies are more amenable than bacteria to the action of chemical agents. The influence of quinine upon the parasites of malaria is a notable example; and Laveran and Mesnil's experiments afford ground for the hope that a remedy may be found for trypanosomiasis. Their experiments were made chiefly with the parasites of Nagana (the tsetse-fly disease), and of the Mal de Caderas (croup in horses in South America). They showed that in mice infected with Nagana the parasite could be made to disappear in from twenty-four to forty-eight hours by injections of arsenate of sodium (0.1 mgr. to 20 gr. of the animal's weight) and by human serum (0.5 to 1 ccm.). The parasites could also be destroyed by mixing blood containing them with the arsenic and serum.

Unfortunately, relapses were wont to occur after the arsenic in three or four days, and after the serum in four to eight days. These could be checked by repeating the remedies, but the tendency to relapse remained. Only in very few cases were the parasites completely destroyed. The arsenic could not be continued without causing chronic poisoning; the effect of the serum wore off as time went on.

Having been supplied with some guinea-pigs infected with the parasite of the Mal de Caderas, some experiments were made with colouring matters of the benzo-purpurine group. Little, if any, success was obtained with the first preparation, but a second one was much more satisfactory. It was composed of 1 mol. of tetrazote benzidimmonosulphuric acid, and 2 mol. of naphthylamin sulphate of soda. It is an acid salt, easily soluble in water and but slightly poisonous; $\frac{1}{2}$ -gr. per kilo of the mouse's weight would represent a lethal dose. The injection causes marked reddening of the skin, visible in the ear in the course of a few minutes.

The general redness lasts from six to ten weeks, and even longer, in the parenchymatous organs. The "trypanroth" therefore enters into visible combination with the constituents of certain cells, forming red granular deposits from which the colouring matter but slowly passes away.

For our therapeutical experiments we need the Caderas trypanosome. For injection, 2 ccm. of a 10 per cent. dilution of the blood of a thoroughly infected mouse was sufficient. In twenty-four hours a few parasites were found; their number rapidly increased on the second and third days. Death occurred on the fourth, or at latest on the fifth day. Mice who received at the same time, in separate spots, an injection of the colouring matter and the infected blood remained healthy and disappearance of the parasites took place when the colouring matter was injected three days after infection. It was found that 3 ccm. of a 1 per cent. solution of "trypanroth" was sufficient to preserve the animal's life; and that doses less than 1 ccm. were insufficient.

The following questions arose as to the value of the colouring matter:

(1) Is the cure of the infected mouse permanent in all cases? (2) Can such a result be obtained in other species of animals? (3) Is the effect equally good upon other kinds of trypanosomes?

(1) It is known that relapses occur after the arsenic and serum treatment, and like drawbacks are connected with "trypanroth." A relapse has occurred as late as sixty-five days after the treatment. It would seem desirable to make a second injection, whereby relapses might possibly be prevented. Curative effects follow the internal administration of "trypanroth"; the animals are fed with cakes, each containing 2 grains.

(2) Other species of animals are not satisfactorily affected by the remedy. In ratio, the development of the parasites was checked; but relapses soon occurred. In guinea pigs and dogs even less success was obtained.

(3) With regard to the action on other trypanosomes, some experiments on mice were made with Nagana poison; but in general with far less favourable results.

It may thus be said that only in one species can success be claimed; but the "trypanroth" is always superior to every other remedy, and its discovery and employment indicate progress. We must try to find some allied chemical substance which will produce a more favourable result. The power of destroying the parasites is certainly limited; many chemicals have been tried, but without avail.

It is an interesting task to sketch the mode of action of the "trypanroth." The easiest assumption is that it kills the parasites by its ordinary disinfectant action, thus resembling arsenic. Experiments, however, show that this explanation is not correct. The addition of a $\frac{1}{2}$ per cent. of the colouring matter to a bottle containing trypanosomes has no effect, even if the mixture be left for two hours in an ice-box.

The destruction of the parasite by "trypanroth" takes place within the body under conditions not reproduced in the glass. It is important to ascertain how long the protection lasts after redness has been present for some weeks in the animal. When infection has been caused, protection can be bestowed by injections of the colouring matter as late as the second day, but not after, inasmuch as the latter then becomes firmly fixed in the tissues, and is no longer in the circulation. It would there-

fore seem that freshly introduced "trypanroth" causes reactions in the body which kill the parasites, but such products have only a temporary existence; their formation ceases when the colouring matter is deposited in the organs.

In another set of experiments, we injected the colouring matter on the fourth day after infection, when the blood contained many parasites. In from one to seven days later we re-injected trypanosomes, but no acute symptoms occurred. Immunity had been produced, far more decided and of longer duration than that due to injection of colouring matter alone. The destroyed parasites caused the development of immunising substances. In one case sixty-five days passed before a relapse occurred. The explanation which suggests itself is that after the death of the parasites portions of infectious materials remain in the various organs. Active immunity results from the absorption of the larger portion of the trypanosomes, but when this ceases, those that have remained in a latent condition resume their pathogenic properties. A similar explanation will apply to the relapses of syphilis and malarious fevers.

T. P. SMITH.

As others see us.—Included in the party of French physicians and surgeons who recently visited London was a military medical officer attached to the head-quarter staff of the French Army, who, after inspecting the various civil institutions in London was anxious to see something of our military medical arrangements. Calling at the War Office, facilities were readily given, and arrangements were made to show our visitor all that was possible within the short time at his disposal.

In the November number of the "*Archives de Médecine et de Pharmacie militaire*," an official publication of the French Ministry of War, a brief account of the visit and the impressions formed are published. The writer, after courteously referring to the cordiality of his reception at the War Office, and to the assistance which was given to him, mentions that he was first shown the Army Medical Stores and the Royal Herbert Hospital at Woolwich, and subsequently the great camp at Aldershot. The notice continues:—

"At Aldershot are the dépôt and school of the Royal Army Medical Corps, where the recruits of the Sanitary Service join immediately after enlistment, and where they receive their military and technical instruction. It must not be forgotten that in England the soldiers of the Sanitary Corps are taught and commanded directly by the medical officers themselves, without any go-between. The dépôt and school are equipped on a scale of comfort everywhere to be found in this country; the men, corporals, and sergeants, have each their own dining-rooms, recreation-rooms, canteens and libraries, separately installed.

"In the Aldershot camp there are three military hospitals:—(1) The Cambridge, (2) The Connaught, and (3) The Louise Margaret; the last reserved for the wives and children of soldiers and non-commissioned officers, and for maternity cases. These institutions are thoroughly well-equipped from every point of view; the buildings are arranged to give the sick the maximum of air and light, the wards are scrupulously clean, the beds have ample floor and air space, the walls are hung with engravings and pictures, and the tables are brightened with flowers. Tuberculous cases are isolated in special wards, fresh air treatment being obtained by

wide open windows night and day, in all seasons. The operation-rooms, which have been recently improved, are furnished with a very complete modern equipment. In short, everything, including the kitchens, denotes comfort and well-being. The nurses, who must have at least four years' previous training in civil hospitals, are obtained from the civil profession, and help the medical officers throughout their work. There is no equivalent to our '*officiers d' administration*.' The rôle of the quartermasters is limited, they carry out orders, and have no disciplinary authority over the subordinate *personnel*. All orders emanate from the senior medical officer, and are given direct without passing through any intermediary channel. The medical officers of the camp have a Mess of their own, handsomely furnished, where our comrade had the honour of being entertained, and where, while refreshing himself at a well-found table, he read the proud motto of the Royal Army Medical Corps: '*In arduis fidelis*,' everywhere in evidence and kept well in mind.

"In London itself, though it was not possible for him to visit the Royal Army Medical College, a recent creation not yet completed, he was able to see and admire that little gem, 'King Edward VII.'s Hospital for Officers.' This is a small private hospital luxuriously furnished, containing a dozen beds reserved for officers, mainly for those requiring operations. It has been established by Miss Keyser, known as 'Sister Agnes,' who has devoted to it much of her private fortune.

"This brief account of our comrade's visit must not be taken as a complete description of all he saw and admired. It has been written to encourage other military medical officers to make similar excursions whenever opportunity offers, on account of the benefits they will derive therefrom, and the instruction they will bring back. But these lines are intended also, and above all, to publicly thank the Director-General of the Army Medical Service, his staff, and the military medical officers at Woolwich and Aldershot, who have received our comrade with open arms and treated him with special consideration, to do honour, not to him personally, but to an officer of the French Military Medical Service."

Correspondence.

THE SCIENCE OF MILITARY HYGIENE.

TO THE EDITOR OF THE "JOURNAL OF THE ROYAL ARMY MEDICAL CORPS."

SIR,—The importance of hygiene and preventive medicine for the efficiency of the Army is well expressed in the aphorism of one of our military leaders: "To keep the troops in good health is more important than to patch them up." In suggesting that something more might be done, during peace time, in the way of studying the means of preventing disease and preparing for the conditions likely to be met with in time of war, I take as my starting-point the recognised value of the ROYAL ARMY MEDICAL CORPS JOURNAL as a stimulus to scientific work. In view of what is already being done, it seems to me that the time has come for considering if it is not possible for the Army to do still more in the way of collecting and systematising all available scientific knowledge which has a direct bearing on Army medical work.

SUGGESTION.

An organised compilation of all available information on such subjects as would be comprised under the general title of Military Hygiene, *e.g.*, the science of those diseases which are particularly liable to be fatal to armies in the field; diseases prevalent in places where British troops are stationed, or are likely to be sent, including tropical diseases; a comparison of English and foreign methods of military medical routine, ambulance services, field hospital work, &c.

The method of treating each subject to be: (1) To provide a summary and impartial critical survey of all important literature dealing with it; (2) to keep this up to date by adding, year by year, a summary and survey of new contributions to each subject.

ARGUMENTS.

(1) A collection, on the widest possible scale, of all information which could be utilised for increasing the physical efficiency of our troops in time of war, would be a work of national importance, and therefore the nation might reasonably be asked to pay for it on the score of its utility.

(2) There are many problems concerning the causation and prevention of disease which are of especial concern to the R.A.M.C., and in the elucidation of which this service has already done much to lead the way. An enterprise such as I suggest would, therefore, appropriately come from them, and it is not likely to be undertaken by any other body.

(3) One important reason for the need of making a collection of existing information is that modern scientific progress is difficult to grasp, owing to the fact that its literature is scattered over an enormous variety of journals. Moreover, scientific work necessitates minute attention to detail, and in the pursuit of detail, general principles are apt to be lost, unless the details, elaborated by independent workers, are grouped together and brought under a general focus. The empirical sciences are

especially in need of this co-ordinating influence, partly from the nature of their subject matter, and partly from the bent of mind of the investigators. Many excellent scientists are so absorbed in the details of their research that they fail to grasp the logic of the general principles involved. Owing to this inability, or to ignorance, or inappreciation of the work of others, at least one half of current scientific literature does not possess sufficient permanent value to justify the amount of labour expended upon it. Many of the existing German works of reference exercise a very useful co-ordinating influence; but the English character, with its cosmopolitanism and love of fair play, is capable of producing still more valuable work of this kind. By bringing to a focus all matters pertaining to military hygiene, we should help our country to gain recognition as the leading authority in the world on this subject.

(4) Such a work of reference would be of especial service to R.A.M.C. Officers engaged in scientific research. Most of them are stationed in places where they have not access to fully-equipped scientific libraries. The efficiency of their work would be increased if they had a ready means of ascertaining what has already been done.

(5) The suggested work would provide an objective standard by which the value of the R.A.M.C. investigations could be estimated. The work published in the ROYAL ARMY MEDICAL CORPS JOURNAL would be duly summarised, and take its proper place amongst the scientific work recorded by the rest of the world. Being grouped in this way, it would be thrown into the light of international criticism, and the knowledge of this would prove a most valuable stimulus to sound work. I do not for a moment suggest that R.A.M.C. work is not up to the average in quality, as compared with other scientific schools; but I firmly believe that any school, however excellent, tends to become narrow and exclusive unless it is encouraged to compare and contrast its results with those obtained by others. This narrowing influence is conspicuous in many of the German pathologists, who seem constrained to accept their general principles from some superior authority; and in the Paris schools the same spirit of narrow exclusiveness has produced still more disastrous results. As it is often impossible for the R.A.M.C. Officer to reply directly to external criticism, it seems to me particularly desirable that he should have the opportunity, by reference to a universal record, of seeing how far the opinions he advocates are gaining ground.

(6) A collection of information such as I suggest would serve to indicate the gaps which most urgently need filling up. The enterprise of scientific investigators is often enticed away into by-paths, with the consequence that their energy, if not actually misdirected, is expended less profitably than it might have been. There is therefore need for a means of keeping the main issues requiring elucidation constantly before them.

(7) Not the least value of the work would be its utility as a store of information available for reference when required. The army may at any moment require expert advice on a question involving medical scientific knowledge. At the present day scientific details are so elaborate and so numerous that it is impossible for any man to carry them all in his mind. There is no expert, either in this or any other country, who can afford to rely entirely on his personal knowledge and impressions. The expert's advice, if it is to be the best he is capable of giving, must be

based on a direct reference to statistics and summaries derived from all available sources of information. The amount of scientific information which it is desirable to have available for the use of the British Army is particularly large; it is directly proportionate to the sphere of British influence.

November, 1st, 1904.

I am, &c,
PROGRESS.

TO THE EDITOR OF THE "JOURNAL OF THE ROYAL ARMY MEDICAL CORPS."

SIR.—I write to ask if you will kindly correct an error which, through an oversight, I made in the prescription which appeared under a letter of mine in the Journal of October, 1904. The proportion of mercury therein stated is not correct, and ought to have been one drachm not two as given, and the prescription ought to read thus:—

R	Hydrarg. pur...	..	..	..	..	..	..	..	℥i.
	Lanolin anhydros.	..	..	..	..	..	..	..	℥iv.
	Parolein carbol 2 per cent.	..	..	..	..	..	..	..	℥v.

℥x. By intramuscular injection, once a week, for patients in hospital.
 ℥v. For those attending
 ℥x. Of this preparation contains approximately 1 gr. of mercury—to be correct
 1·09 gr.

The following is a standard solution of the same preparation, and contains 1 gr. in every ℥x.

R	Hydrarg. pur ..	..	..	..	..	..	..	..	℥ss.
	Lanolin anhydros.	..	..	..	..	..	..	..	℥ij.
	Parolein carbol 2 per cent. ad.	..	..	..	..	..	..	..	℥v.

By volume.

Finished product equals 1 gr. in x. minims.

November 11th, 1904.

St. George's Road,
Eccleston Square, London.

F. J. LAMBRIN.
Lieutenant-Colonel, R.A.M.C.

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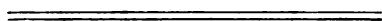
OF THE

ARMY MEDICAL STAFF

AND

ROYAL ARMY MEDICAL CORPS.

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[This List is prepared according to the latest information received. Officers are invited to communicate any particulars regarding alterations, errors, or omissions, to Major T. McCULLOCH, R.A.M.C., 68, Victoria Street, S.W.]

SPECIALIST CERTIFICATES IN :

- a = State Medicine (R.A.M. College qualification).
- b = Diploma in Public Health.
- c = Bacteriology.
- d = Dental Surgery.
- e = Dermatology and Venereal Diseases.
- f = Specific Fevers.
- g = Laryngology.
- h = Midwifery and Gynæcology.
- j = Operative Surgery.
- k = Ophthalmology.
- l = Otology.
- m = Paediatrics.
- n = Psychological Medicine.
- o = Skiagraphy.
- p = Tropical Medicine.

ARMY MEDICAL SERVICE.

HEADQUARTER STAFF.

Rank.	Name.	Appointment.
Surgeon-General ..	Keogh, A., M.D., C.B. ..	Director-General of Army Med. Services.
" ..	Fawcett, W. J., M.B., C.B. ..	Deputy Director-General.
Lieutenant-Colonel ..	Babbie, W., M.B., V.C., C.M.G. ...	Assistant Director-General.
Major ..	McCulloch, T., M.B. ..	Deputy Assistant Director-General.
Lieutenant-Colonel ..	Russell, M. W. ..	" " " "
Major ..	Thurston, H. C., C.M.G. .	" " " "

ARMY MEDICAL SERVICE ADVISORY BOARD.

Rank.	Name.	Appointment.
Brevet-Colonel ..	Bruce, D., F.R.S., M.B. ..	Expert in Tropical Diseases.
Lieutenant-Colonel ..	Davies, A. M. ..	Expert in Sanitation.
" ..	Skinner, B. M. ..	Secretary.

ROYAL ARMY MEDICAL COLLEGE.

Rank.	Name.	Appointment.
Colonel (temporary)	James, H. E. R. ..	Commandant and Director of Studies.
Surgeon-General (temporary)	Stevenson, W. F., M.B., C.B., K.H.S.	Prof. of Clinical and Military Surgery.
Lieutenant-Colonel ..	Firth, R. H. ..	Professor of Military Hygiene.
Major ..	Leishman, W. B., M.B. ..	" " Pathology.
" ..	Fowler, C. E. P. ..	Assistant Professor of Military Hygiene.
Captain ..	Harvey, D., M.B. ..	" " Pathology.

SURGEON-GENERALS.

Name.	Station.	Appointment.
Burnett, W. F. ..	Eastern Command, India ..	Principal Medical Officer.
Clery, J. A., M.B., C.B. ..	Southern Command, England ..	" " "
Charlton, W. J. ..	Eastern Command, England ..	" " "
Donovan, W., C.B. ..	South Africa ..	" " "
Edge, J. D., M.D., C.B. ..	Irish Command ..	" " "
Fawcett, W. J., M.B., C.B. ..	Headquarter Staff ..	" " "
Galloway, Sir T. J., M.D., K.C.M.G., C.B. ..	India ..	" " "
Gubbins, W. L., M.B., M.V.O. ..	Western Command, India ..	" " "
McNamara, W. H., M.D., C.B., C.M.G. ..	Aldershot Command ..	" " "
Townsend, Sir E., M.D., K.C.B., C.M.G. ..	Netley ..	" " "

COLONELS.

Name.	Station.	Appointment.	Specialist Certifi- cates in.
Barrow, H. J. W.	Ambala, India	Principal Medical Officer	—
Blennerhassett, B. M., C.M.G.	Rawalpindi, India	" " " "	—
Bourke, G. D.	Devonport	Administrative Medical Officer	—
Chester, W. L., M.B.	Peshawar, India	Principal Medical Officer	—
Dorman, J. C., M.B., C.M.G.	Cape Colony, S. Africa	" " " "	—
Duke, A. W., M.D.	Chester	Principal Medical Officer, Welsh and Midland Commands	—
Ellis, P. M.	Curragh	Administrative Medical Officer	—
Fenn, E. H., C.I.E.	Chatham	" " " "	—
Hughes, G. A., M.B., D.S.O.	Edinburgh	Principal Medical Officer, Scottish Command	—
Kenny, W. W., M.B.	Pretoria	Principal Medical Officer, Trans- vaal District	—
Leake, G. D. N.	Lucknow, India	Principal Medical Officer	—
McNamara, J., M.D.	Gibraltar	" " " "	—
May, W. A., C.B.	Tidworth	Administrative Medical Officer	—
Magill, J., M.D., C.B.	Cairo	Principal Medical Officer, H.M. British Troops, Egypt	—
Morris, J. J., M.D.	Portsmouth	Administrative Medical Officer	—
O'Connell, M. D., M.D.	York	Principal Medical Officer, North- ern Command	—
Pratt, W. S., M.B.	Mhow, India	Principal Medical Officer	—
Quill, R. H., M.B.	Dover	Administrative Medical Officer	—
Rainsford, W. J. R., C.I.E.	Bermuda	Principal Medical Officer	—
Routh, J. I.	India	" " " "	—
Stevenson, W. F., M.B., C.B., K.H.S. (temporary Surgeon-General)	London	R.A.M. College	—
Saunders, W. E., C.B.	Naini Tal, India	Officiating Principal Medical Offi- cer, Eastern Command	—
Slaughter, W. B.	Colchester	Administrative Medical Officer	—
Swayne, C. H., D.S.O.	Cork	" " " "	—
Sloggett, A. T., C.M.G.	London District	Principal Medical Officer	—
Trevor, F. W., M.B.	Poona, India	" " " "	—
Webb, W. E., M.D.	Hong Kong	" " " " S. China	b.
Williamson, J. F., M.B., C.B., C.M.G.	Bombay, India	" " " "	—
Wolseley, W. O.	Malta	" " " "	—
Whitehead, H. R.	India	" " " "	—

LIEUTENANT-COLONELS.

(Under Article 365 of the Royal Warrant.)

Anderson, L. E.	London	Temporary duty, Headquarters	—
Babbie, W., M.B., V.C., C.M.G.	War Office, London	Headquarter Staff	—
Bruce, D., F.R.S., M.B. (Brevet-Colonel)	London	Expert in Tropical Diseases, Army Medical Service Advisory Board	—
Bedford, W. G. A., M.B., C.M.G.	Gibraltar	Officer in charge Military Hospital	—
Corker, T. M., M.D.	Belfast	Administrative Medical Officer	—

Name.	Station.	Appointment.	Specialist Certifi- cates in.
Coutts, G., M.B.	Salisbury	Assistant to Principal Medical Officer, Southern Command	—
Croly, A. E. J.	Edinburgh	Officer in charge Military Hospital and Officer Commanding 13th Coy. R.A.M.C.	—
Dodd, J. R., M.B.	Mhow, India	Officer in charge Military Hospital	—
Emerson, I. B.	York	—	—
Forman, R. H., M.B.	Woolwich	Officer in charge Royal Herbert Hospital	—
Ford, R. W., D.S.O.	Royal Hospital, Chelsea	Deputy Surgeon	—
Goggin, G. T.	Belfast	Officer in charge Military Hospital	—
Hodson, R. D.	Ceylon	Senior Medical Officer	—
Harwood, J. G.	Portsmouth	Officer in charge Military Hospital	—
Heffernan, W.	Wynberg, S. Africa	" " " "	—
Hathaway, H. G.	Poona, India	" " " "	—
Inman, A. W. P., M.B.	Allahabad, India	Offg. Principal Medical Officer ..	—
Johnston, P. H., M.D., C.M.G.	Jamaica	Senior Medical Officer and Officer Commanding, R.A.M.C.	—
Johnston, W. T., M.D.	Canterbury	Officer in charge Military Hospital	—
Jennings, R., M.D.	Valetta, Malta	—	—
Jones, J. M.	Devonport	Officer in charge Military Hospital and Officer Commanding 7th Coy. R.A.M.C.	—
Kirkpatrick, H. C., M.D.	Barbados	Senior Medical Officer	—
Kerin, M. W.	Peshawar, India	Officer in charge Military Hospital and Principal Medical Officer Khyber movable column	—
Lloyd, O. E. P., V.C.	Ootacamund, India	Staff Officer to Madras Division of the Army Bearer Corps	—
Love, R. L., M.D.	Fermoy	Officer in charge Military Hospital	—
MacNeece, J. G.	Dublin	Medical Inspector of Recruits, Irish Command	—
Moffitt, T. B.	Lucknow, India	Officer in charge Military Hospital	—
Martin, H., M.B.	Shorncliffe	—	—
Mulvany, P.	Alton	Officer in charge Princess Louise Hospital	—
MacNeece, T. F.	Cork	Officer in charge Military Hospital	—
Maclean, F. B.	Woolwich	Standing Board Survey Army Medical Stores	—
Macnamara, W. J., M.D.	Bloemfontein, S. Africa	Principal Medical Officer Orange River Colony and Officer in charge Military Hospital	—
Milward, E. O.	Southampton	Embarkation Medical Officer ..	—
Murray, H. W., M.B.	Halifax, N.S.	Senior Medical Officer and Officer in command, R.A.M.C., Canada	—
Maunsell, E. L.	Gosport	Officer in charge Military Hospital	—
Mosse, C. G. D.	Winchester	" " " "	—
Moberley, H. J. R.	Aldershot	Officer in charge Connaught Hosp.	—
North, E. (Col., Mauritius)	Mauritius	Senior Medical Officer	—
O'Connor, A. P., C.B.	Bordon	Administrative Medical Officer ..	—
O'Sullivan, D.	Mian Mir, India	Officer in charge Military Hospital	—
Peterkin, A., M.B.	Curragh	Officer in charge Military Hospital and Officer Commanding 17th Coy. R.A.M.C.	—
Roche, E. A.	Chatham	Officer in charge Military Hospital and Officer Commanding 10th Coy. R.A.M.C.	—
Robinson, G. W.	Aldershot	Officer Comdg. Depot, R.A.M.C. ..	—
Robinson, S. C. B.	Colchester	Officer in charge Military Hospital	—
Somerville-Large, B. W.	York	" " " "	—
Seymour, C., M.B.	Royal Hospital, Chelsea	Physician and Surgeon	—
Sylvester, G. H.	Netley	In charge Surgical Division ..	—
Todd, O., M.B.	Cairo, Egypt	Officer in charge Military Hospital	—

Name.	Station.	Appointment.	Specialist Certifi- cates in.
Twiss, G. E.	Netley	Registrar and Secretary ..	—
Webb, C. A.	Dover	Officer in charge Military Hospital	b.
Wardrop, D., M.B. ..	Rawalpindi, India ..	" " " " " " " "	—
Woods, C. R., M.D. ..	Dublin	Officer in charge Royal Infirmary and Officer Commanding 14th Coy. R.A.M.C.	b.

LIEUTENANT-COLONELS.

Allport, H. K., M.D. ..	Bulford	Officer in charge Military Hospital	—
Burlton, A. H.	Returning to England, tour expired	" " " " " "	—
Battersby, H. L.	Bareilly	Officer in charge Military Hospital	—
Baker, W. J.	Returning to England, tour expired	" " " " " "	—
Butt, E.	Dublin	" " " " " "	—
Birrell, W. G., M.B. ..	Edinburgh	Medical Inspector of Recruits, Scottish Command	—
Brazier-Creagh, G. W., C.M.G.	Fyzabad, India	Officer in charge Military Hospital	—
Barratt, H. J.	Agra, India	" " " " " "	—
Burton, F. H. M., M.D. ..	Standerton, S. Africa ..	" " " " " "	—
Bartlett, C. R.	Tower Hill, West Africa ..	Senior Medical Officer and in charge Military Hospital	—
Brooke-Pechell, Sir A. A., Bt., M.B.	Portsmouth	" " " " " "	—
Bond, R. P.	Returning to England, tour expired	" " " " " "	—
Braddell, M. O'D., M.B.	Woolwich	Registrar and Secretary Royal Herbert Hospital, Officer Com- manding 12th Coy. R.A.M.C.	—
Battersby, J., M.B.	Chester	Medical Inspector of Recruits, Welsh and Midland Command	—
Beevor, W. C., M.B., C.M.G.	Karachi, India	Officer in charge Military Hospital	—
Birt, C.	Pretoria, S. Africa ..	In charge A.M.S. Laboratory	—
Berryman, W. E.	Dover	" " " " " "	—
Cowen, W. D. A.	Alderney, C.I.	Officer in charge Military Hospital	—
Culling, J. C.	Pembroke Dock	" " " " " "	—
Carmichael, J.	Warley	" " " " " "	—
Caldwell, R.	Meerut, India	Officer in charge Military Hospital and in charge Dist. Laboratory	b.
Daly, F. A. B., M.B., C.B.	Standerton, S. Africa ..	Officer in charge Military Hospital	—
Davies, A. M.	London	Expert in Sanitation, Army Medi- cal Service Advisory Board	b.
Dundon, M.	Devonpor	Anæsthetist	—
Dick, W.	Fort Cauning, S. Setts. ..	Senior Medical Officer	b.
Donnet, J. J. C.	Quetta, India	" " " " " "	—
Dugdale, W.	Wynberg, S. Africa ..	" " " " " "	—
Dempsey, P. J., M.D. ..	Portsmouth	Officer in charge Military Hospital	—
Dodd, A.	Chester	" " " " " "	—
Duncan, S. E.	Returning to England, tour expired	" " " " " "	—
Flanagan, J. W. H.	Lichfield	Officer in charge Military Hospital	—
Franklin, D. F.	Chakrata, India	" " " " " "	—
Faunce, C. E.	Bombay, India	" " " " " "	—
Firth, R. H.	London	R.A.M. College	b.
Freyer, S. F., M.B., C.M.G.	Aldershot	" " " " " "	—
Forrest, J. R.	Ahmedabad, India	Officer in charge Military Hospital	b.
Geoghegan, A. O., M.D. ..	Bury	" " " " " "	—
Gibson, J., M.B.	Templemore	" " " " " "	—
Geddes, R. J., M.B., D.S.O.	Maryhill	" " " " " "	b.
Gubbin, G. F.	Eastern Comd., England	" " " " " "	b.

Name.	Station.	Appointment.	Specialist Certifi- cates in.
Hall, J. L.	Quetta, India	Officer in charge Military Hospital	—
Hetherington, R. P., M.D.	Dublin	Officer in charge Military Hos- pital, Portobello	—
Hubbard, H. W.	Aldershot	Officer in charge Cambridge Hosp.	—
Hackett, R. I. D.	Harrismith, S. Africa	Senior Medical Officer and Officer in charge Military Hospital	—
Haslett, J. C., M.D.	Allahabad, India	Officer in charge Military Hospital	—
Hale, G. E., D.S.O.	Kirkee, India	" " " "	—
Hamilton, T. W. O. H., M.B., C.M.G.	Limerick	" " " "	—
Heuston, F. S., C.M.G.	Royal Hosp., Kilmainham	Physician and Surgeon	—
Hunter, G. D., D.S.O.	Egypt	Principal Medical Officer Egyptian Army	—
Haines, H. A., M.D.	Dalhousie, India	Officer in charge Military Hospital	—
Henderson, R. S. F., M.B.	Deesa, India	Officer in charge Military Hos- pital Station Staff and Detach- ment Laboratory	—
Irvine, D. L.	Aldershot	In charge Cavalry Brigade	—
Irwin, J. M., M.B.	"	Assistant to Principal Medical Officer, Aldershot Army Corps	—
Johnston, H. H., M.D., C.B.	Netley	In charge Medical Division	b.
Jencken, F. J., M.B.	Deolali, India	Officer in charge Military Hospital	—
James, H. E. R. (tempo- rary Colonel.)	London	R.A.M. College	b.
Johnson, C. W., M.B.	Cawnpore, India	In charge Cantonment Hospital..	—
Kay, A. G., M.B.	Netley	Officer in charge Lunatic Hospital	—
Kirkpatrick, R., M.D., C.M.G.	Jullundur, India	Officer in charge Military Hospital	—
Lucas, T. J. R., M.B.	Alexandria, Egypt	" " " "	—
Lane, A. V.	Glasgow	In charge Recruiting Duties " . .	—
Lambkin, F. J.	Returning to England, tour expired	" " " "	—
Lougheed, S. F., M.D., C.M.G.	Royal Arsenal, Woolwich	Senior Medical Officer	—
Lynden-Bell, E. H. L.	Allahabad, India	" " " "	—
Lilly, A. T. J.	Returning to England, tour expired	" " " "	—
McCreery, B. T., M.B.	Kinsale	Officer in charge Military Hospital	b.
Morse, R. E. R.	Newcastle-on-Tyne	" " " "	—
Magrath, C. W. S., M.D.	Hilsa	" " " "	—
Morris, W. A.	Sialkot, India	" " " "	—
McGill, H. S.	Returning to England, tour expired	" " " "	b.
Macpherson, W. G., M.B., C.M.G.	Attached Japanese Army	" " " "	b.
Moore, R. R. H., M.D.	Aldershot	In charge R.E., A.S.C., & R.A.M.C.	—
Maher, J.	Sandhurst	Surgeon R.M.C.	—
Manders, N.	Curepipe, Mauritius	Officer in charge Military Hospital	—
Moffet, G. E., M.B.	Perth	" " " "	b.
Noding, T. E.	Middelburg, Transvaal	" " " "	—
Nicholls, F. P., M.B.	Barbados	" " " "	—
Nichol, C. E., M.B., D.S.O.	Ranikhet, India	" " " "	—
O'Keefe, M. W., M.D.	Woolwich	In charge Medical Division Royal Herbert Hospital	—
O'Donnell, T. J., D.S.O.	Preston	Officer in charge Military Hospital	—
O'Brien, R. F.	Sheerness	Officer in charge Military Hospital and Recruiting	—
O'Connell, D. V., M.D.	Gibraltar	In charge Staff and Departments	b.
Porter, R., M.B.	Pretoria, S. Africa	Officer in charge Military Hospital	—
Pike, W. W., D.S.O.	India	" " " "	—
Rhodes, J. H. A.	Valetta, Malta	Officer in charge Military Hospital	—
Rowney, W., M.D.	Cawnpore, India	" " " "	—
Rose, A. S., M.D.	Meerut, India	" " " "	—
Risk, E. J. E.	Hollywood	" " " "	—

Name.	Station.	Appointment.	Specialist Certifi- cates in.
Reade, W. L.	Weedon	Officer in charge Military Hospital	—
Russell, A. F., M.B., C.M.G.	London	Medical Inspector of Recruits, Eastern Command	—
Rockitt, J. D. T.	Multan, India	Officer in charge Military Hospital	—
Reilly, C. C.	Murree, India	See "Headquarter Staff"	—
Russell, M. W.	War Office, London	See "Headquarter Staff"	—
Reid, J. M., M.D.	Salisbury	Medical Inspector of Recruits, Southern Command	—
Shiabey, L. W.	Calcutta, India .. ..	.. .. .. .	—
Sawyer, R. H. S., M.B.	S. Africa .. ..	.. .. .. .	—
Skinner, B. M.	London	Secretary, Army Medical Service Advisory Board	—
Simpson, R. J. S., M.B., C.M.G.	London	Assistant to Principal Medical Officer, Eastern Command	—
Semple, D., M.D.	Kasauli, India	In charge Anti-rabic Institute	—
Stuart, J. R., M.B.	Fort George	Officer in charge Military Hospital	—
Sloggett, H. M.	Cottonera, Malta .. ..	.. .. .. .	—
Scanlan, A. De C.	Aldershot	Officer in charge Isolation Hosp.,	—
Townsend, S., M.D.	Wellington, India	Officer in charge Military Hospital	—
Thiele, C. W., M.B.	Warrington .. ..	.. .. .. .	—
Treherne, F. H.	Nowshera, India	Officer in charge Military Hospital and Cantonment Hospital	b.
Trevor, H. O.	Aldershot	Medical Inspector of Recruits for Aldershot Army Corps	—
Tyrell, C. R.	Shorncliffe .. ..	.. .. .. .	—
Thompson, W. B.	Portsmouth	In charge Military Families Hosp.	—
Tate, A. E.	Nasirabad, India	Staff Surgeon in charge Army Hd- qr. Staff and Establishment	—
Thompson, H. N., M.B., D.S.O.	Woking	Officer in charge Military Hospital	—
Turner, W.	Kasauli, India .. ..	.. .. .. .	—
White, H. L. E.	Woolwich	Recruiting Duties	—
Woodhouse, T. P.	Ambala, India	Officer in charge Military Hospital	—
Weston, G. E.	Prospect, Bermuda .. ..	.. .. .. .	—
Wight, E. O.	Hounslow	Officer in charge Military Hospital and Recruiting	—
Westcott, S., C.M.G.	York	Medical Inspector of Recruits, Northern Command	—
Wyatt, H. J.	Curragh .. ..	.. .. .. .	—
Wilson, G., M.B.	Ferozepore, India .. ..	.. .. .. .	—
Winter, T. B.	Returning to England, tour expired .. ..	.. .. .. .	—
Yourdi, J. R., M.B.	Secunderabad, India	Officiating Principal Medical Offi- cer and Officer in charge Military Hospital	—

MAJORS.

Adams, G. G.	Nowgong, India	Officer in charge Military Hospital	—
Allen, S. G.	Ambala, India .. ..	.. .. .. .	b.
Adamson, H. M., M.B.	Bareilly, India .. ..	.. .. .. .	—
Aldridge, A. R., M.B.	Naini Tal, India	Sanitary Officer, Eastern Commd.	b.
Austin, H. W.	Quetta, India .. ..	.. .. .. .	—
Allport, C. W., M.D.	Fort Allahabad, India	Officer in charge Military Hospital	—
Alexander, G. F., M.B.	Bloemfontein, S. Africa .. ..	.. .. .. .	—
Austin, J. H. E.	Fort Canning, S. Setts.	Officer in charge Military Hospital	—
Anderson, E. C., D.S.O.	Shorncliffe .. ..	.. .. .. .	—
Alexander, J. D., M.B.	Returning to England, tour expired .. ..	.. .. .. .	—
Austin, R. F. E.	Imtarfa, Malta	Officer in charge Military Hospital	—

Name.	Station.	Appointment.	Specialist Certificates in.
Anderson, J. B.	Meerut, India .. ..	.. .. .. .	c.
Buchanan, G. J., M.B. ..	Bareilly, India	In charge District Laboratory ..	—
Bray, H. A.	Attached Egyptian Army ..	.. .. .. .	—
Buswell, F. R.	Belgaum, India .. ..	.. .. .. .	—
Black, J. G., M.D.	Wei-hai-Wei, N. China ..	.. .. .. .	—
Buchanan, J. B. W., M.B.	Darjeeling, India	Officer in charge Military Hospital, Cantonment Hospital, and Gurkha Recruiting Depot	—
Brown, H. H., M.B.	Sheffield .. ..	.. .. .. .	—
Baylor, H. T.	Shorncliffe .. ..	.. .. .. .	—
Burchaell, C. H., M.B. ..	S. Africa	S. African Constabulary	—
Bent, G.	India .. ..	.. .. .. .	—
Barefoot, G. H.	St. Lucia, West Indies ..	Officer in charge Military Hospital	—
Browning, T.	Buttevant	" " " "	—
Buist, R. N., M.B.	Sialkot, India .. ..	.. .. .. .	—
Burnside, E. A.	Punjab, India .. ..	.. .. .. .	—
Browne, E. G.	Ireland .. ..	.. .. .. .	—
Bullen, J. W., M.D.	Mullingar	Officer in charge Military Hospital	—
Boles, W. S., M.B.	Dundalk	" " " "	—
Bate, A. L. F.	Mhow, India .. ..	.. .. .. .	—
Blenkinsop, A. P.	Lucknow, India .. ..	.. .. .. .	—
Borradaile, A. L., M.B. ..	Brecon	Officer in charge Military Hospital	—
Birt, T.	Returning to England, tour expired	.. .. .. .	—
Beach, T. B.	Shoburness .. ..	.. .. .. .	—
Bewley, A. W.	Dublin .. ..	.. .. .. .	—
Beveridge, W. W. O., M.B., D.S.O.	London	In charge Chelsea Barracks ..	b.
Bray, G. A. T.	India .. ..	.. .. .. .	—
Buist, H. J. M., M.B., D.S.O.	Pretoria, S. Africa ..	Staff Officer to Principal Medical Officer, S. Africa	—
Brogden, J. E.	Portland	Officer in charge Military Hospital	—
Begbie, F. W.	Returning to England, tour expired	.. .. .. .	—
Beyts, W. G.	Ambala, India .. ..	.. .. .. .	—
Blackwell, C. T., M.D. ..	Quetta, India	Officer in charge District Labo- ratory	b.
Brannigan, J. H.	Sheffield	Officer in charge Military Hospital	—
Berryman, H. A.	Gibraltar	Company Officer	o.
Cree, H. E.	Dover	In charge Recruiting	—
Cocks, H., M.B.	Bangalore, India .. ..	.. .. .. .	—
Corkery, T. H.	Devonport	In charge Military Prison and Re- cruiting	—
Clarkson, T. H. F.	Jersey	Officer in charge Military Hos- pital, Fort Regent	—
Cottell, R. J. C.	Woolwich	Officer in charge Military Families Hospital	h.
Cummins, H. A., M.D., C.M.G.	Rawalpindi .. ..	.. .. .. .	b.
Cockerill, J. W.	Prospect, Bermuda ..	In charge Effective Troops ..	—
Clark, S. F., M.B.	Cape Colony, S. Africa ..	Sanitary Officer	b.
Copeland, R. J., M.B. ..	Portsmouth .. ..	.. .. .. .	—
Connor, J. C., M.B.	Ireland .. ..	.. .. .. .	—
Crawford, G. S.	Aldershot	Officer in charge 3rd Brigade ..	b.
Condon, E. H., M.B.	Ambala, India .. ..	.. .. .. .	—
Chambers, A. J.	Netley	In charge Staff and Families ..	—
Cardoza, S. N.	Golden Hill, I. of Wight	Officer in charge Military Hospital	—
Cree, G.	Devonport	In charge Hospital for Soldiers' Wives and Children	—
Curtis, J. H.	Returning to England, tour expired	.. .. .. .	—
Collins, D. J., M.B.	Dublin	Anæsthetist Royal Infirmary ..	k. b.
Carr, H., M.D.	Mount Abu, India	Officer in charge Military Hospital and Lawrence School	—

Name.	Station.	Appointment.	Specialist Certifi- cates in.
Durant, R. J. A.	Dum Dum, India.	Officer in charge Military Hospital, Ammunition Factory, Cossipore and Dukinsore Factories, and Cantonment Outdoor Dispen- sary	—
Davis, E.	Subathu, India	Officer in charge Military Hospital and Cantonment Hospital	—
Day, W. B., M.B.	Curragh	In charge Hospital for Soldiers' Wives and Children	—
Daly, J. H.	Queenstown . . . . .	.. .. .	—
Daly, T.	Poonamallee, India	Officer in charge Military Hospital	—
Davidson, J. S., M.B.	Parkhurst . . . . .	.. .. .	—
Donegan, J. F.	Cairo, Egypt	Officer in charge Military Hospital, Kasr-el-Nil	—
Donaldson, J.	Agra, India . . . . .	.. .. .	—
Dowman, W. S.	India . . . . .	.. .. .	—
Davoren, V. H. W.	Devonport	Company Officer	—
Dalton, C.	India . . . . .	.. .. .	—
Duggan, C. W., M.B.	India . . . . .	.. .. .	—
Dunn, H. N., M.B.	Royal Arsenal, Woolwich . . . . .	.. .. .	—
Elderton, F. D.	Newport, Mon.	Officer in charge Military Hospital	—
Elkington, H. P. G.	Aldershot	Sanitary Officer, Aldershot Army Corps	b.
Eckersley, E., M.B.	Woolwich . . . . .	.. .. .	—
Edye, J. S.	India . . . . .	.. .. .	—
Elliott, C. R., M.D.	Poona, India	Sanitary Off., Western Command	b.
Erskine, W. D., M.B.	Khartoum, Soudan, Egypt	Officer in charge Military Hospital	—
Ferguson, N. C., M.B., C.M.G.	Middleburg, Cape Colony . . . . .	.. .. .	b.
Fallon, J.	Dagshai, India . . . . .	.. .. .	—
Fayrer, J., M.D.	Duke of York's School	Officer in Medical charge	—
Freeman, E. C.	Colchester	Sanitary Officer, Northern Area, Eastern Command	b.
Forde, B., M.B.	Middelburg, Transvaal . . . . .	.. .. .	—
Ferguson, J. D., D.S.O.	Cork . . . . .	.. .. .	—
Faichnie, N., M.B.	York	Sanitary Off., Northern Command	b.
Fleming, C. C., M.B., D.S.O.	Glasgow	Adjutant Glasgow Coy., R.A.M.C. (Volunteers)	—
Faichnie, F. G.	Jubbulpore, India	In charge Gun Carriage Factory and District Laboratory	—
Fletcher, H. J., M.B.	Chatham	Officer in charge Casualty Hospital and Recruiting	—
Fitzgerald, A. O.	Gosport . . . . .	.. .. .	—
Fowler, C. E. P.	London	R.A.M. College	k. b.
Green, J. S., M.B.	Dublin . . . . .	.. .. .	—
Gordon, P. C. H.	Bangalore, India . . . . .	.. .. .	—
Griffiths, A. P. H.	Birmingham	Officer in charge Military Hospital	—
Gerrard, J. J., M.B.	Eastern Commd., England . . . . .	.. .. .	—
Garner, C., M.B.	Egyptian Sanitary Depart- ment . . . . .	.. .. .	—
Gray, W. L., M.B.	Valetta, Malta	Sanitary Officer and in charge Laboratory	b.
Girvin, J.	London	In charge Wellington Barracks and Company Officer	—
Graham, W. A. S. J.	Chatham	Casualty Hospital	—
Gibbard, T. W., M.B.	London	Adjutant London Coy., R.A.M.C. (Volunteers)	k.
Goodwin, T. H. J. C., D.S.O.	Woolwich	Officer in charge Cadet Hospital, Royal Military Academy	j. o.
Greig, F. J.	Aldershot Depot	2nd in Command and Instructor	—
Hickson, S., M.B. (Brevet- Lieutenant-Colonel)	Woolwich	In charge Surgical Division, Royal Herbert Hospital	—
Hearn, M. L.	N. China	Senior Medical Officer	—

Name.	Station.	Appointment.	Specialist Certifi- cates in.
Hall, R. H., M.D.	Cork	Company Officer, Anæsthetist, and in charge of Recruiting	—
Hanley, R. G., M.B.	Rawalpindi, India	.. .. .	—
Harris, F. W. H. D.	Bodmin	Officer in charge Military Hospital	—
Hall, F. W. G., M.B.	India	.. .. .	—
Hayman, S. J. W.	Barrackpore, India	.. .. .	—
Hennessey, D., M.D.	Athlone	Officer in charge Military Hospital	—
Hall, R. J. D.	Hollywood	.. .. .	—
Hosie, A., M.B.	London	Sanitary Officer, Southern Area, Eastern Command	b.
Holyoake, R.	Colchester	Company Officer	—
Hayes, J. P. S.	Dover	.. .. .	—
Horrocks, W. H., M.B.	Gibraltar	Sanitary Officer	b.
Hale, C. H., D.S.O.	Rangoon, India	Officer in charge Military Hospital	—
Hinde, A. B.	.. .. .	.. .. .	—
Hore, H. St. G. S.	Birr	Officer in charge Military Hospital	—
Holt, M. P. C., D.S.O.	Dublin	.. .. .	j.
Hassard, E. M.	Jamaica	Officer in charge Military Hospital at Up Park Camp	—
Hallaran, W., M.B.	Ferozepore, India	In charge Cantonment Hospital	—
Healey, C. W. R.	Dublin	.. .. .	—
Hardy, F. W., M.B.	Cairo, Egypt	Sanitary Officer	b.
Healy, C. J., M.B.	Colombo, Ceylon	Officer in charge Military Hospital	—
Hardy, W. E.	Shorncliffe	.. .. .	—
Hennessey, J., M.B.	Adeu	Officer in charge Military Hospital	—
Hinge, H. A.	Aldershot	Officer Comdg. "B" Company, Depôt, R.A.M.C.	—
Hodgens, C. O'C.	Up Park Camp, Jamaica	.. .. .	—
Innis, B. J.	Lucknow, India	.. .. .	—
Jones, F. W. C., M.B.	Nasirabad, India	Officer in charge Military Hospital	—
Josling, C. L.	Hong Kong, S. China	Officer in charge Military Hospital, Victoria	—
Julian, O. R. A., C.M.G.	Chatham	Anæsthetist	b.
Jackson, R. W. H., M.B.	Cork	Sanitary Officer	b.
Jennings, J. W., D.S.O.	India	.. .. .	o.
Jameson, J. C., M.B.	Royal Arsenal, Woolwich	.. .. .	b.
Johnson, H. P.	Bareilly, India	.. .. .	—
Jones, T. P., M.B.	Woolwich	Adjutant Woolwich Coy., R.A.M.C. (Volunteers)	—
Kearney, J., M. D.	Wrexham	Officer in charge Military Hospital	—
Kennedy, A.	Poona, India	.. .. .	—
Knaggs, H. T., M.B.	Dublin	In charge Staff and Depts., North	—
Kelly, J. F. M., M.B.	Returning to England, tour expired	.. .. .	—
Keble, A. E. C.	Chatham	In charge Military Families Hosp.	h.
Lane, C. A., M.B.	Trincomali, Ceylon	Officer in charge Military Hospital	—
Lavie, T. G.	Bellary, India	.. .. .	—
Le Quesne, F. S., V.C.	Lucknow, India	.. .. .	—
Leishman, W. B., M.B.	London	R.A.M. College	—
Luther, A. J.	Delhi, India	Officer in charge Military Hospital	—
Lenahan, T. J., M.B.	Middleburg, C. C., S. Africa	Company Officer	—
Lawson, C.B., M.B.	Valetta, Malta	Bacteriologist and Anæsthetist	o.
Lewis, R. C.	Ranikhet, India	In charge Cantonment Hospital, Staff Surgeon and Civil Surgeon	—
Longhurst, B. W.	Cyprus	Officer in charge Military Hospital	d.
Menville, C. H., M.B.	Wellington, India	Sanitary Officer Madras Command	b.
Mills, B. L., M.D.	Poona, India	Staff Officer, Army Bearer Corps, Western Command	b.
Moir, J., M.B.	Landguard	Officer in charge Military Hospital	—
MacDonald, C. J., M.D.	Fermoy	Anæsthetist and in charge Officers, Women and Children	—
Mathias, H. B., D.S.O.	Campbellpore, India	Officer in charge Military Hospital and Cantonment Hospital	—

Name.	Station.	Appointment.	Specialist Certifi- cates in.
Marder, E. S.	Canterbury . . . .	.. .. .	—
Marks, G. F. H., M.D.	Sitapur, India	Officer in charge Military Hospital and Cantonment Hospital	—
Morgan, F. J.	Ambala, India	In charge Cantonment Hospital	—
McCulloch, T., M.B.	War Office, London	Headquarter Staff	—
Macdonald, S., M.B.	Woolwich . . . . .	.. .. .	—
Morgan, J. C.	Calcutta, India	In charge District Laboratory	b.
Mould, W. T.	Fatehgar, India	Officer in charge Military Hospital and Gun Carriage Factory	—
McLoughlin, G. S., M.B., D.S.O.	Sierra Leone, W. Africa..	Officer in charge Military Hospital, Mount Auriol	—
Mawhinny, R. J. W.	Multan, India	Staff Surgeon	—
McDowell, F.	Peshawar, India . . . .	.. .. .	—
MacCarthy, I. A. O.	Kilkenny	Officer in charge Military Hospital	—
Mason, H. D.	Allahabad, India . . . .	.. .. .	—
Morphew, E. M.	Returning to England, tour expired	.. .. .	—
Mitchell, L. A., M.B.	Jubbulpore, India	Officer in charge Cantonment Hosp.	—
Martin, C. B., M.B.	Netley	Assistant Secretary and Registrar	—
McNaught, J. G., M.D.	Edinburgh	Sanitary Officer	b.
McDermott, T., M.B.	Calcutta, India . . . .	.. .. .	k.
More, L. P., M.B.	Bareilly, India . . . .	.. .. .	—
Moore, G. A., M.D.	Warley . . . . .	.. .. .	g.
Marder, N.	Netley . . . . .	.. .. .	—
Meek, J., M.D.	Tower of London.. . . .	Officer in charge Military Hospital	—
Morris, A. E., M.D.	Woolwich . . . . .	.. .. .	—
Mansfield, G. S., M.B.	Rochester Row, London..	.. .. .	—
Mangin, F. M.	Jamaica . . . . .	.. .. .	k.
Molesworth, R. E.	Ranikhet, India . . . .	.. .. .	—
Macleod, R. L. R., M.B.	Dublin	Sanitary Officer	b.
Maturin, B. A.	Woolwich . . . . .	.. .. .	—
Nicolls, J. M.	Forrest, Malta	Officer in charge Military Hospital	—
Nash, L. T. M.	Portsmouth . . . . .	.. .. .	—
Newland, F. R., M.B.	Hyderabad, India.. . .	Officer in charge Military Hospital	—
O'Halloran, M., M.D.	Harrismith, S. Africa . . . .	.. .. .	—
O'Donnell, J. J., M.B.	Leeds	Officer in charge Military Hospital	—
O'Callaghan, D. M.	Bedford . . . . .	.. .. .	—
O'Reilly, H. W. H., M.B.	Wynberg, S. Africa	Anæsthetist and Company Officer	—
Penton, R. H., D.S.O.	Southern Comd., England	.. .. .	—
Poole, W. C., M.B.	Saugor, India	Officer in charge Military Hospital and Cantonment Hospital	—
Pocock, H. J.	Aldershot	In charge 4th Brigade	—
Paterson, J., M.B.	Watford, Bermuda	Officer in charge Military Hospital and Army Medical Stores	—
Peeko, H. S.	Aldershot	Company Officer No. 1 Company	—
Parry, H. J., M.B., D.S.O.	Aldershot	Officer Comdg. "A" Company, Depôt, R.A.M.C.	—
Powell, E. E.	Gibraltar	In charge Moorish Castle and Poca Roca	—
Pearse, A.	Welsh and Mid. Command	Sanitary Officer	b.
Porter, F. J. W., D.S.O.	Colchester . . . . .	.. .. .	—
Pilcher, E. M., M.D., D.S.O.	Royal Arsenal, Woolwich	.. .. .	—
Pollock, C. E.	Malta . . . . .	.. .. .	e.o.
Powell, S., M.B.	Aldershot	Officer in charge Louise Margaret Hospital	—
Power, R. I.	Ballincollig	Officer in charge Military Hospital	—
Philson, S. C.	Roorkee, India . . . .	.. .. .	—
Pinches, W. H.	Shorncliffe	In "charge Recruiting"	—
Rowan, H. D., M.B.	Mian Mir, India . . . .	.. .. .	—
Russell, J. J., M.B.	Rawalpindi, India	Staff Surgeon	—
Raymond, G., M.B.	Bangalore, India	In charge District Laboratory	b.
Reily, A. Y., M.B.	Maymyo, India . . . .	.. .. .	—
Ritchie, J., M.B.	Tanglin, S. Setts.. . . .	Officer in charge Military Hospital	—

Name.	Station.	Appointment.	Specialist Certifi- cates in.
Rawnsley, G. T.	Portsmouth	In charge Effective Troops ..	—
Reilly, C. W.	Dublin	Officer in charge Military Hos- pital, Arbor Hill	—
Robinson, O. L.	Gibraltar	In charge Windmill Hill, Buena Vista and Military Prison	—
Read, H. W. K.	India .. ..	.. .. .	—
Rivers, J. H.	Attached Egyptian Army	.. .. .	o.
Sexton, M. J., M.D.	Muttra, India	Officer in charge Military Hospital	—
Starr, W. H.	Dover	Officer in charge Section Hospital, Dover Castle	—
Sutton, A. A., D.S.O. .. ..	.. ..	.. .. .	—
Saw, F. A., M.D.	Secunderbad, India .. ..	.. .. .	b.
Squire, W. P.	Chatham	Officer in charge Military Hospital	—
Salvage, J. V., M.D.	Tidworth	Sanitary Officer, Eastern Area, Southern Command	b.
Saunders, D. M., M.D.	Dublin	Assistant to Principal Medical Officer, Irish Command	b.
Scott, G., M.B.	Multan, India .. ..	.. .. .	—
Scott, B. H.	Rawalpindi, India	Sanitary Officer, Northern Com- mand	b.
Stiell, D., M.D.	Thayetmyo, India	Officer in charge Military Hospital	—
Salmon, L. E. A.	Southern Command, Eng- land	.. .. .	—
Stone, C. A., M.D.	Dover	In charge Officers, Women and Children	—
Smith, F., D.S.O. .. ..	.. ..	.. .. .	b.
Smithson, A. E., M.B.	Middleburg, C.C., S. Africa	Anæsthetist	b.
Shanahan, D. D.	Tipperary	Officer in charge Military Hospital	—
Samman, C. T.	Jamaica	Officer in charge Military Hospital, Newcastle	n.b.
Stalkartt, C. E. G., M.D.	St. Helena	Officer in charge Military Hospi- tal, Women and Children, and Senior Medical Officer	—
Stanistreet, G. B., M.B.	Cairo, Egypt	Company Officer	—
Spencer, C. G., M.B.	Curragh	Operating Surgeon	j.
Stalkartt, H. A., M.B.	Kailana, India .. ..	.. .. .	—
Slayter, E. W., M.B.	Naini Tal, India	Officer in charge Military Hospital and in charge Headquarter Staff and Establishment	—
Symons, F. A., M.B.	Jubbulpore, India .. ..	.. .. .	—
Swan, W. T., M.B.	Jullundur, India .. ..	.. .. .	—
Shine, J. M. F., M.D.	Dublin .. ..	.. .. .	—
Sparkes, C. S.	Kowloon, Hong Kong	Officer in charge Military Hospital	—
Tatham, C. J. W.	Devonport	Sanitary Officer, Western Area, Western Command	b.
Trotter, W. J.	Citta Vecchia, Malta	Officer in charge Sanatorium ..	—
Thurston, H. C., C.M.G.	War Office, London	Headquarter Staff	—
Thacker, R. C.	Jhansi, India	Officer in charge Military Hospital	—
Thomson, J., M.B.	Edinburgh .. ..	.. .. .	—
Tate, G. W., M.B.	Barberton, S. Africa	Officer in charge Military Hospital	—
Tyacke, N.	Jutogh, India	Officer in charge Military Hospital and Cantonment Hospital	—
Thurston, H. S.	N. China .. ..	.. .. .	—
Tyrrell, A. F.	Gibraltar .. ..	.. .. .	—
Thompson, A. G., M.B. .. ..	.. ..	.. .. .	—
Taylor, W. J., M.B.	Neemuch, India	In Medical charge, Station Staff, and Agency Surgeon	o.
Wills, S. R.	Pietermaritzburg, S. Africa	Officer in charge Military Hospital and Senior Med. Officer, Natal	—
Wilson, J. B., M.D.	Cairo, Egypt	Officer in charge Abbassiyeh ..	—
Will, J., M.B.	(Seconded Colonial Govt.)	.. .. .	—
Wright, R. W.	Portsmouth	Company Officer	—
Whitty, M. J., M.D.	Cahir	Officer in charge Military Hospital	—

Name.	Station.	Appointment.	Specialist Certifi- cates in.
Windle, R. J., M.B.	Dublin	In charge Staff and Depts., South	—
Watson, J. J., M.D., C.I.E.	St. George's, Bermuda	Officer in charge Military Hospital	—
Whaite, T. Du B., M.B.	Gibraltar	Officer in charge Military Hospital	—
Watson, A. O. C., M.B.	Aberdeen	Officer in charge Military Hospital	b.
Wade, G. A., M.D.	Dorchester	Officer in charge Military Hospital	b.
Weir, J. C., M.B.	London	Sanitary Officer London District	b.
Wright, A.	Halifax, N.S.	Officer in charge Military Hospital	—
Winter, H. E.	India	Officer in charge Military Hospital	—
Way, L.	Meerut, India	Officer in charge Military Hospital	—
Williams, E. McK.	Guildford	" " " "	—
Whitstone, C. W. H., M.B.	Eastern Com., England	" " " "	—
Wade-Brown, F. J.	Gosport	Officer in charge Military Hospital	—
Withers, S. H., M.B.	Benares, India	Officer in charge Military Hospital	—
Yarr, M. T.	India	Staff of Governor of Bombay	—
Young, C. A.	Enniskillen	Officer in charge Military Hospital	—

CAPTAINS.

Ashe, F.	Returning to England, ..	tour expired	—
Adye-Curran, S. M.	St. Lucia, W.I.	In charge Officers, Women and Children at Vigie	—
Anderson, H. S.	London	R.A.M. College	—
Adye-Curran, W. J. P.	Dublin		—
Argles, R. L.	Bulford		—
Adderley, A. C.	Secunderabad, India		—
Aylen, E. V.	Wei-hai-Wei, N. China		—
Archer, S. A.	Belfast		—
Addams-Williams, L.	Standerton, S. Africa	Sanitary Officer and Anæsthetist,	—
Archer, G. J. S., M.B.	Returning to England, tour expired		—
Bransbury, H. A.	Kandia, Crete		—
Black, R. B., M.B.	Attached Egyptian Army		—
Barbour, J. H., M.B.	Halifax, N.S.	Sanitary Charge, Citadel	—
Bostock, J. S., M.B.	Malta	In charge Troops, St. Francis Barracks	—
Beatty, M. C., M.B.	Mhow, India	In charge District Laboratory	—
Brodribb, E.	Gibraltar		—
Barrow, H. P. W.	Ambala, India		—
Brakenridge, F. J.	Attached Egyptian Army		b.
Blackwell, W. R.	R.A.M. College		—
Butler, S. G.	Fort Tregantle	Officer in charge Military Hospital	—
Bond, J. H. R.	Returning to England, tour expired		—
Babington, M. H.	R.A.M. College		—
Buist, James M., M.B.	Transvaal, S. Africa		—
Biggam, T., M.B.	Poona, India		—
Baker, W. L.	Meiktila, India		—
Bennett, W., M.B.	Lucknow, India		—
Bartlett, B. S.	Delhi, India		—
Bennett, E.	Bloemfontein, S. Africa		—
Brown, R. T., M.D.	Lucknow, India	Staff Surgeon, in charge District Laboratory	b.
Bennett, W. L., M.B.	Jullundur, India		—
Burke, B. B.	Rawalpindi, India		—
Baillie, G., M.B.	Quetta, India		—
Bodington, P. J., M.B.	London District		—
Brunskill, J. H., M.B.	India		—
Bateman, H. R.	Valetta, Malta		—

Name.	Station.	Appointment.	Specialist Certifi- cates in.
Barnett, K. B., M.B.	N. China	.. .. .	m.
Boyle, M., M.B.	Shwebo, India	Officer in charge Military Hospital	o.
Buist, John M., M.B.	Pretoria, S. Africa	.. .. .	b. c.
Blackham, R. J.	Bulford	.. .. .	h.
Bliss, E. W.	Sierra Leone, W. Africa	Officer in charge Military Hospital at Mabanta	j.
Birrell, E. T. F., M.B.	Rawalpindi, India	Personal Assistant to Principal Med. Off., Northern Command	—
Bowen, A. W. N.	Woolwich	.. .. .	—
Browne-Mason, H. O. B.	Returning to England, tour expired	.. .. .	—
Berne, J. G.	Purandhar, India	Officer in charge Military Hospital	g.
Bourke, E. A.	Londonderry	" " " "	b. f.
Clark, E. S., M.B.	Peshawar, India	.. .. .	f.
Cameron, K. M., M.B.	Ambala, India	.. .. .	j.
Campbell, J. H., D.S.O.	Colchester	In charge Military Families Hosp.	h.
Cochrane, E. W. W., M.B.	West Africa	.. .. .	c.
Clements, R. W., M.B.	Manchester	Adjutant Manchester Companies R.A.M.C. (Volunteers)	o.
Corkery, M. P.	Meerut, India	Staff Surgeon	—
Clarke, T. H. M., M.B., C.M.G., D.S.O.	Colchester	.. .. .	—
Cummins, S. L., M.B.	Attached Egyptian Army	.. .. .	—
Carroll, F. F., M.B.	Devonport	.. .. .	j.
Carter, G. B., M.B.	Madras, India	.. .. .	—
Cowan, J., M.B.	Netley	.. .. .	—
Curme, D. E.	Thayetmyo, India	.. .. .	—
Cunningham, R. A., M.B.	Returning to England, tour expired	.. .. .	—
Chopping, A.	Windsor	In charge Women and Children	—
Crawford, V. J.	Cork	.. .. .	—
Connolly, E. P.	R.A.M. College	.. .. .	—
Crean, T. J., V.C.	.. .. .	.. .. .	—
Cumming, C. C., M.B.	Peshawar	.. .. .	—
Carylon, A. F.	Southern Command, England	.. .. .	—
Cato, C. S.	Chester	.. .. .	—
Croly, W. C.	Secunderabad, India	.. .. .	—
Cotton, F. W.	Nowshera, India	.. .. .	—
Carroll, G.	Sitapur, India	.. .. .	—
Churton, J. G.	Nowgong, India	.. .. .	—
Cuthbert, J. M., M.B.	Agra, India	In charge District Laboratory	—
Carr, C. H., M.D.	Hyderabad, India	.. .. .	—
Crosthwait, W. S.	Calicut, India	.. .. .	—
Cautley, J. B.	Roorkee, India	.. .. .	—
Challis, O.	Malta	.. .. .	—
Cowie, R. V.	Bangalore, India	.. .. .	—
Conway, J.	Lucknow, India	.. .. .	—
Clarke, J. B., M.B.	Meerut, India	.. .. .	—
Cotterill, L.	Secunderabad, India	.. .. .	—
Collingwood, P. H.	Ashton-under-Lyne	Officer in charge Military Hospital	—
Crisp, G. B.	R.A.M. College	.. .. .	—
Craig, B. A.	Hong Kong, S. China	In charge H. S. Meeanee	—
Dansey-Browning, G.	Attached Egyptian Army	.. .. .	b.
Delap, G. G., D.S.O.	Returning to England, tour expired	.. .. .	—
Douglas, H. E. M., V.C., D.S.O.	Mian Mir, India	.. .. .	b.
Dorgan, J., M.B.	Poona, India	In charge Cantonment Hospital	—
Diinnis, B.R., M.D.	Secunderabad, India	In charge District Laboratory	—
Douglass, P. C.	Mhow, India	.. .. .	—
Duffey, A. C., M.D.	Pretoria, S. Africa	.. .. .	—
Davidson, H. A., M.B.	St. Thomas's Mount, India	.. .. .	b.
Davis, W.	Meerut, India	.. .. .	—

Name.	Station.	Appointment.	Specialist Certifi- cates in.
Ellery, E. E.	Returning to England, tour expired	.. .. .	—
Elsner, O. W. A.	R.A.M. College .. ..	.. .. .	—
Ensor, H., M.B., D.S.O.	Attached Egyptian Army	.. .. .	—
Evans, C. R.	Khandalla, India.. ..	Officer in charge Military Hospital	—
Ellery, R. F.	Allahabad, India .. ..	.. .. .	—
Evans, P., M.B.	Aldershot	Company Officer, No. 2 Company	b. f. j.
Fell, M. H. G.	R.A.M. College .. ..	.. .. .	—
Falkner, P. H.	Dublin	Anæsthetist	—
Foster, J. G., M.B.	Port Louis, Mauritius	Officer in charge Military Hospital	—
Ford, E. G., M.B.	Malta	In charge troops, Fort Ricasoli	—
Fawcus, H. B., M.B.	Gibraltar .. ..	.. .. .	—
Fielding, T. E., M.B.	Jamaica .. ..	.. .. .	—
Furnivall, C. H.	Quetta, India	In charge District Laboratory	—
Fitzgerald, Fitz G. G.	Curragh	Anæsthetist, Company Officer, and Instructor	—
Fry, W. B.	Rawalpindi, India .. ..	.. .. .	—
Fleming, C. E., M.B.	St. Lucia, W.I.	In charge Officers, Women and Children at the "Morne"	—
Fawcett, R. F. M.	Halifax, N.S.	Sanitary Charge, Wellington and Glacis Barracks	—
Falkner, M. W.	Muttra, India .. ..	.. .. .	—
Foulds, M. F.	Saugor, India .. ..	.. .. .	—
Ffrench, E. G., M.B.	Jamaica	In charge Officers, Women and Children, Military Prison, and A. M. Stores	—
French, H. C.	Cyprus .. ..	.. .. .	e. b.
Fleury, C. M.	Malta .. ..	.. .. .	o.
Fox, A. C. .. ..	.. ..	.. .. .	h.
Fairrie, S. H.	Shorncliffe	Officer in charge Military Families Hospital, and Anæsthetist	h.
Forrest, J. V., M.B.	Tower Hill, W. Africa .. ..	.. .. .	—
Fuhr, R. S. H., D.S.O.	Murree, India	Officer in Charge Headqr. Staff	—
Gallie, J. S.	Bordon	Officer in charge Detention Hosp.	—
Gill, J. G.	Aldershot .. ..	.. .. .	—
Goddard, G. H.	Bloemfontein	In charge Female Hospital and Military Prison	—
Goldsmith, G. M., M.B.	Dublin .. ..	.. .. .	—
Greenwood, A. R.	Secunderabad, India .. ..	.. .. .	—
Goodwin, W. R. P.	Rawalpindi, India .. ..	.. .. .	—
Gibson, A. W.	Deolali, India	Offi. in charge Cantonment Hosp.	—
Green, S. F. St. D.	Prospect, Bermuda	In charge Staff and Departments, Officers, Women, and Children	b.
Grattan, H. W.	Sierra Leone, W. Africa.. ..	Sanitary Officer	b. c.
Gunter, F. E., M.B.	R.A.M. College .. ..	.. .. .	—
Grech, J.	Dinapore, India	Specialist in Skiagraphy for East- ern Command	o.
Gwynn, W. P.	Devonport .. ..	.. .. .	—
Hewetson, H.	Dover	Company Officer	a. b.
Hudleston, W. E.	Kamptee, India .. ..	.. .. .	b. f.
Hopkins, C. H.	Bombay, India .. ..	.. .. .	f.
Hall, S. O.	Madras, India .. ..	.. .. .	h.
Heffernan, F. J. C.	York	Company Officer	—
Herrick, H.	R.A.M. College .. ..	.. .. .	—
Hewitt, E. P.	St. George's, Bermuda	In charge Staff and Departments, Officers, Women and Children	—
Houghton, J. W. H., M.B.	R.A.M. College .. ..	.. .. .	b.
Harvey, D., M.B.	R.A.M. College .. ..	.. .. .	—
Humphrey, L.	Dublin .. ..	.. .. .	—
Harrison, L. W., M.B.	Sialkot, India .. ..	.. .. .	—
Harvey, F.	R.A.M. College .. ..	.. .. .	—
Hime, H. C. R., M.B.	R.A.M. College .. ..	.. .. .	—
Hartigan, J. A., M.B.	Peshawar, India .. ..	.. .. .	—

Name.	Station.	Appointment.	Specialist Certifi- cates in.
Hyde, D. O., M.B.	Karachi, India	.. .. .	—
Hamerton, A. E., D.S.O.	Ferozepore, India	.. .. .	—
Houghton, G. J.	Calcutta, India	Staff Surgeon	—
Henderson, P. H., M.B.	Ahmednagar, India	In charge Cantonment Hospital	—
Hardy, F. H.	Alton	.. .. .	—
Hunt, R. N., M.B.	Secunderabad, India	.. .. .	—
Howley, H. E. J. A.	Warwick Camp, Bermuda	In charge Troops	—
Hull, A. J.	Jhansi, India	In charge Cantonment Hospital	—
Harding, D. L.	Secunderabad, India	.. .. .	—
Hodgson, J. E.	Calcutta, India	.. .. .	—
Hyde, P. G., M.B.	Bareilly, India	.. .. .	—
Harrison, W. S., M.B.	Aldershot	.. .. .	c.
Howell, H. A. L.	Chatham	Company Officer	f.
Hayes, E. C.	Rochester Row, London	.. .. .	k.
Hooper, A. W., D.S.O.	Poona, India	.. .. .	—
Harvey, W. J. S.	Hong Kong, S. China	.. .. .	—
Irvine, F. S., M.B.	Aldershot	.. .. .	—
Irwin, A. W. A.	Barbados	In charge Women and Children	—
Inkson, E. T., V.C.	R.A.M. College	.. .. .	—
Jameson, A. D.	Malta	.. .. .	—
Johnson, J. T., M.D.	Hong Kong, S. China	In charge Lyemun Forts	—
Jones, J. L.	Colombo, Ceylon	In charge Officers and their Families	—
Knox, E. B., M.D.	Simla, India	Secretary, Principal Medical Officer, India	—
Kennedy, J. C., M.B.	Valetta, Malta	Mediterranean Fever Commission	—
Kiddle, F., M.B.	Ahmednagar, India	.. .. .	k.
Lawson, D.	Netley	Anæsthetist	—
Lowsley, M. M.	Portsmouth	.. .. .	—
Lupton, A. C., M.D.	York	.. .. .	—
Lauder, T. C., M.B.	Dublin	.. .. .	b.
Leake, J. W.	Watford, Bermuda	.. .. .	—
Lloyd, L. N., D.S.O.	Winchester	.. .. .	—
Lauder, F. P.	Ootocamund, India	Personal Asst. to Principal Medical Officer, Secunderabad Command	—
Lelean, P. S.	Aldershot	In charge Women and Children, Marlboro' Lines	—
L'Estrange, E. F. Q.	.. .. .	.. .. .	—
Lambelle, F. W., M.B.	Hong Kong, S. China	In charge Female Hosp., Victoria	—
Lloyd, R. H.	Welsh and Midland Command	.. .. .	—
Langstaff, J. W.	Hulme, Manchester	Officer in charge Military Hospital	—
Mainprise, C. W.	Tidworth	.. .. .	—
Morris, J. I. W.	Rochester Row, London	.. .. .	—
MacKenzie, T. C., D.S.O.	.. .. .	.. .. .	—
Morton, H. M., M.B.	Returning to England, tour expired	.. .. .	—
Matthews, J.	Deepcut	Officer in charge	—
McLoughlin, W. M.	Middelburg, Transvaal	.. .. .	—
MacLaughlin, A. M., M.B.	Belfast	.. .. .	—
Merry, F. H., M.B.	Harrismith, S. Africa	Sanitary Officer	—
Martin, J. F., M.B.	Attock, India	Officer in charge Military Hospital	—
McDonnell, E., M.B.	Maymyo, India	Officer in charge Military Hospital and 2/10 Gurkha Rifles and Staff Surgeoncy	—
McLennan, F., M.B.	Lucknow, India	.. .. .	—
Murphy, J. P. J., M.B.	Nowshera, India	.. .. .	—
Myles, C. D., M.B.	Jhansi, India	.. .. .	—
Mason, S. A.	Middleburg, Cape Colony, S. Africa	Sanitary Officer	—
Mitchell, A. H. McN.	Cawnpore, India	Staff Surgeon, Special Health Officer	—
McGregor, H. J., M.B.	Woolwich	.. .. .	b.
McMunn, A.	Ambala, India	.. .. .	—

Name.	Station.	Appointment.	Specialist Certifi- cates in.
McMunn, J. R.	Pretoria, S. Africa .. ..	.. .. .	f.
Master, A. E., M.B.	Cottonera, Malta	Company Officer	g.
Milner, A. E.	Ootacamund, India	Offg. Staff Off. to Madras Divi- sion of the Army Bearer Corps	o.
Morgan, C. K.	Cairo, Egypt	Skiagraphist	o.
Maurice, G. T. K.	India .. ..	.. .. .	m.
Morris, A. H.	Chatham .. ..	.. .. .	b. c.
MacDougall, A. J., M.B.	Piershill	Officer in charge Military Hospital	c.
Marriott, E. W. P. V.	Pembroke Dock .. ..	.. .. .	o.
McKessack, P., M.B.	Plymouth	Officer in charge Women and Children	
McCarthy, J. McD., M.B.	Chester .. ..	.. .. .	a. b.
Martin, H. G.	Ballincollig .. ..	.. .. .	h.
Macpherson, J. D. G., M.B.	Portsmouth .. ..	.. .. .	—
Norman, H. H.	R.A.M. College .. ..	.. .. .	—
Nicholls, H. M., M.B.	Cork .. ..	.. .. .	—
Nickerson, W. H. S., V.C., M.B.	R.A.M. College .. ..	.. .. .	—
Nickerson, G. S., M.B.	Attached Egyptian Army	.. .. .	—
Norrington, H. L. W.	Returning to England, tour expired	.. .. .	—
O'Flaherty, A. R.	Mhow, India	Consulting Surgeon R.M. Ry. ..	—
Ormsby, G. J. A., M.D.	Dublin	Company Officer	—
O'Reilly, P. S.	Quetta, India	In charge Station Staff	—
Odlum, W. H.	Nasirabad, India	In charge Cantonment Hospital ..	—
O'Donoghue, D. J. F.	Belgaum, India .. ..	.. .. .	—
O'Grady, S. de C., M.B.	Limerick .. ..	.. .. .	a.
O'Gorman, C. J., D.S.O.	R.A.M. College .. ..	.. .. .	—
Prynn, H. V.	Woolwich	Ophthalmologist, Royal Herbert Hospital	k.
Profeit, C. W., M.B.	Dagshai, India .. ..	.. .. .	g.
Perry, S. J. C. P.	Wilberforce, W. Africa	Officer in charge Military Hospital	o.
Probyn, P. J., D.S.O.	R.A.M. College .. ..	.. .. .	—
Phillips, R. E. G.	R.A.M. College .. ..	.. .. .	—
Poe, J., M.B.	Newbridge	Officer in charge Military Hospital	—
Penny, F. S.	Lucknow, India .. ..	.. .. .	—
Parker, L. E. L.	R.A.M. College .. ..	.. .. .	—
Packer, H. D.	Cork .. ..	.. .. .	—
Palmer, F. J.	R.A.M. College .. ..	.. .. .	—
Prescott, J. J. W., D.S.O.	Devonport .. ..	.. .. .	—
Parry, F. M., M.B.	Aden .. ..	.. .. .	—
Powell, J., M.B.	Rawalpindi, India .. ..	.. .. .	—
Purser, L. M., M.B.	Diyatalawa, Ceylon	Officer in charge Military Hospital	—
Popham, R. L.	Victoria, B.C. .. ..	.. .. .	—
Power, W. M.	Poona, India .. ..	.. .. .	—
Pinches, H. G.	Lucknow, India .. ..	.. .. .	—
Parsons, A. R. C.	Ghain Tufficha, Malta	Officer in charge N. D. Hospital	—
Powell, E. W.	Cork .. ..	.. .. .	—
Parkes, E. E., M.B.	Gibraltar .. ..	.. .. .	—
Palmer, H. K.	Fermoy .. ..	.. .. .	—
Potter, T. J.	Poona, India .. ..	.. .. .	—
Riddick, G. B.	Aldershot .. ..	.. .. .	—
Rattray, M. MacG., M.B.	Bombay, India .. ..	.. .. .	—
Ross, N. H., M.B.	Canterbury	In charge Recruiting	—
Rutherford, N. J. C., M.B.	Cape Town, S. Africa	In charge Detention Hospital, and Embarking Medical Officer	—
Richards, F. G.	Aldershot .. ..	.. .. .	—
Roch, H. S.	R.A.M. College .. ..	.. .. .	—
Robinson, J. H.	Rawalpindi, India .. ..	.. .. .	—
Ronayne, C. R. L., M.B.	Calcutta, India .. ..	.. .. .	—
Riach, W., M.D.	Alexandria, Egypt .. ..	.. .. .	b.
Ryan, E.	Cottonera, Malta .. ..	.. .. .	—
Roche, J. V.	Fyzabad, India	In charge Cantonment Hospital ..	—

Name.	Station.	Appointment.	Specialist Certificates in.
Rowan Robinson, F. E., M.B.	Aden	In charge District Laboratory ..	—
Ritchie, T. F., M.B.	Ferozepore, India ..	Staff-Surgeon	—
Rogers, H., M.B.	Mian Mir, India ..	" " " " " " " " ..	—
Scott, A. L.	Pretoria, South Africa ..	In charge Troops, Artillery Bks. ..	—
Sloan, J. M., M.B., D.S.O.	Edinburgh	Company Officer	—
Scarlett, W. W.	Returning to England, tour expired ..	" " " " " " " " ..	—
Simson, H.	Pretoria, South Africa ..	Anæsthetist	—
Seeds, A. A., M.D.	Harrismith, South Africa ..	In charge Prison and Native Hospital, Company Officer and Anæsthetist ..	—
Siberry, E. W.	Returning to England, tour expired ..	" " " " " " " " ..	—
Smith, C. S., M.B.	Woolwich	" " " " " " " " ..	—
Safford, A. H.	Ranikhet, India ..	" " " " " " " " ..	—
Sewell, E. P., M.B.	Dalhousie, India ..	Staff Surgeon	—
Straton, C. H.	Landour, India ..	" " " " " " " " ..	—
Stevenson, T. H., M.B.	Fyzabad, India ..	" " " " " " " " ..	—
Spiller, W. M. H., M.B.	Allahabad, India ..	" " " " " " " " ..	b.
Shea, H. F., M.B.	Tidworth	" " " " " " " " ..	—
Stephens, F. A.	Gibraltar	Anæsthetist	—
Steele, W. L.	Lucknow, India ..	" " " " " " " " ..	—
Sparkes, W. M. B.	Amritsar, India ..	Officer in charge Military Hospital ..	—
Smith, S. B., M.B.	Multan, India ..	" " " " " " " " ..	—
Silver, J. P., M.B.	Barbados	In charge Officers, Staff, and Departments ..	—
Sweetnam, S. W.	Colchester	" " " " " " " " ..	—
Steel, E. B., M.B.	Aldershot	Officer Comdg. "C" Company, Depôt, R.A.M.C. ..	n.
Skinner, R. McK.	Gibraltar	In charge Grand Casemates Bks. ..	—
Sheehan, G. F.	Blakan Mati, S. Setts. ..	Officer in charge Military Hospital ..	—
Scott, H. H., M.B.	Pietermaritzburg, S. Africa ..	Company Officer and Anæsthetist ..	—
Sampey, A. W.	W. Africa	" " " " " " " " ..	b.
Staddon, H. E.	Vocoas, Mauritius ..	In charge Effective European Troops and in charge Detention Hospital ..	—
Smith, L. F., M.B.	Mount Auriol, W. Africa ..	" " " " " " " " ..	f.
Statham, J. C. B.	Netley	Bacteriologist	b. c.
Swabey, M.	Newcastle-on-Tyne ..	" " " " " " " " ..	m.
Stammers, G. E. F.	Curepipe, Mauritius ..	In charge Effective Troops and Hosp. for Women and Children ..	—
Stallard, H. G. F.	Attached Egyptian Army ..	" " " " " " " " ..	—
Selby, R., M.B.	Woolwich	" " " " " " " " ..	—
Tibbits, W., M.B.	Barrackpore, India ..	In charge Cantonment Hospital ..	—
Thom, G. St. C., M.B.	Aldershot	Adjutant Depôt, R.A.M.C. ..	l.
Thorp, A. E.	R.A.M. College	" " " " " " " " ..	—
Taylor, H. S.	Tower Hill, W. Africa ..	In charge Effective Troops, Women and Children ..	—
Tobin, J.	Indore, India	Officer in charge Military Hospital ..	—
Thorpe, L. L. G.	Aden	No. 16/B B.F. Hospital, Dthala ..	—
Thomson, C. G.	Dublin	" " " " " " " " ..	—
Unwin, T. B., M.B.	Ceylon	Officer in charge Military Hospital, Kandy ..	—
Vaughan-Williams, H. W., M.B.	O.R. Colony, S. Africa ..	" " " " " " " " ..	—
Walton, H. B. G.	Barbados	In charge W. I. Regiment and Military Prison ..	—
Winkfield, W. B.	R.A.M. College	" " " " " " " " ..	—
Wroughton, A. O. B.	Mandalay, India	" " " " " " " " ..	—
Woodside, W. A.	R.A.M. College	" " " " " " " " ..	—
Webb, A. L. A.	Kirkee, India	In charge Cantonment Hospital ..	—
Winslow, L. F. F.	Gibraltar	In charge Europa Barracks ..	—
Wood, L.	Rawalpindi, India ..	" " " " " " " " ..	—
Wingate, B. F.	Aldershot	" " " " " " " " ..	—

Name.	Station.	Appointment.	Specialist Certifi- cates in.
Waring, A. D., M.B.	Jubbulpore, India	.. .. .	—
Weston, A. F.	Rawalpindi, India	.. .. .	—
Waters, W. J.	Chakrata, India	.. .. .	—
Whelan, J. F., M.B.	Peshawar, India	.. .. .	—
West, J. W., M.B.	Bloemfontein, S. Africa	.. .. .	—
White, T.	Fort Chambray, Gozo, Malta	Officer in charge Military Hospital	—
Worthington, E.S.	Agra, India	.. .. .	—
Wills, A. J. W.	Poonamallee, India	.. .. .	—
Woodley, R. N.	Cottonera, Malta	In charge women and children, Verdala District	—
Winder, J. H. R., M.D.	Malta	Officer in charge troops, Tigne, Manoel and Sliema Districts	—
Wilson, R. C.	Cairo, Egypt	Anæsthetist, and in charge Mena Camp	—
Williamson, A. J., M.B.	Quetta, India	.. .. .	—
Williams, E. M.	Valetta, Malta	In charge Staff and Depts., Female Hospital, and Company Officer	b.
Waring, A. H.	Gosport	In charge Fort Rowner	o.
Ward, W. A.	Bangalore, India	.. .. .	—
Wanhill, C. F.	Prospect, Bermuda	Sanitary Officer	b. c.
Watts, B.	York	In charge Staff and Departments	—
Weld, A. E.	Devonport	.. .. .	b.
Walker, F. S.	Fort Lahore, India	.. .. .	—
Young, A. H. O.	Dublin	.. .. .	—

LIEUTENANTS.

Ainsworth, R. B.	Secunderabad, India	.. .. .	—
Ahern, D.	Karachi, India	.. .. .	—
Arthur, A. S., M.B.	Peshawar, India	.. .. .	—
Anderson, R. G.	.. .. .	On probation	—
Ahern, M. D.	Ferozepore, India	.. .. .	—
Balck, C. A. J. A., M.B.	Ambala, India	.. .. .	—
Bagshawe, H. V.	Rangoon, India	.. .. .	—
Browne, W. W.	Wellington, India	.. .. .	—
Bell, J. G., M.B.	Bangalore, India	.. .. .	—
Bridges, R. H.	Bangalore, India	.. .. .	—
Brown, G. H. J., M.B.	Maymyo, India	.. .. .	—
Bramhall, C.	Aden	.. .. .	—
Bradley, C. R.	Kamptee, India	.. .. .	—
Bousfield, L., M.B.	R.A.M. College	.. .. .	—
Bowle, S. C.	India	.. .. .	—
Byan, W.	.. .. .	On probation	—
Beadnell, H. O. M.	Curragh	In charge Military Prison	—
Buchanan, R. J. B.	R.A.M. College	On probation	—
Booth, E. B., M.B.	R.A.M. College	.. .. .	—
Crossley, H. J.	Wellington, India	In charge Cantonment Hospital and Staff Surgeon	—
Clarke, F. A. H.	Chakrata, India	Staff Surgeon and in charge Can- tonment Hospital	—
Conway, J. M. H.	Ambala, India	.. .. .	—
Coates, T. S., M.B.	Colaba, India	.. .. .	—
Carmichael, J. C. G., M.B.	St. Thomas's Mount, India	.. .. .	—
Carmichael, D. G., M.B.	Rangoon, India	In charge District Laboratory	—
Crawford, J. M. M.	Mian Mir, India	.. .. .	—
Collins, R. T.	India	.. .. .	—
Cathcart, G. E.	Rawalpindi, India	.. .. .	—

Name.	Station.	Appointment.	Specialist Certifi- cates in.
Connell, H. B. .. ..	.. ..	Seconded with Foreign Office	.. —
Cahill, R. J., M.B. ..	Peshawar, India .. ..	.. ..	.. —
Campbell, J., M.B. ..	Curragh .. ..	.. ..	.. —
Carter, H. St. M., M.D. ..	.. ..	On probation	.. ..
Cordner, R. H. L. ..	Aldershot .. ..	.. ..	.. —
Churchill, G. B. F. ..	R.A.M. College	On probation	.. ..
Davidson, P., M.B., D.S.O.	Rawalpindi, India .. ..	.. ..	.. —
Dawson, F. W. W., M.B.	Middleburg, C.C., S. Africa	.. ..	.. —
Dunbar, B. H. V. ..	Poona, India .. ..	.. ..	.. —
Duguid, J. H., M.B. ..	Tanglin, S. Setts. ..	.. ..	.. —
Dudding, T. S. ..	Bloemfontein, S. Africa ..	.. ..	.. —
Dunkerton, N. E. ..	Dublin .. ..	.. ..	.. —
Douglass, J. H., M.D.	India .. ..	.. ..	.. —
Dwyer, P. ..	Dublin .. ..	.. ..	.. —
Davy, P. C. T. ..	Aldershot .. ..	.. ..	.. —
Doig, K. A. C. ..	Bordon	In charge Troops	.. ..
Ellis, W. F. ..	Multan, India .. ..	.. ..	.. —
Franklin, R. J. ..	Benares, India .. ..	.. ..	.. —
Fawcett, H. H. J. ..	Mooi River, South Africa	Officer in charge Military Hospital, Sanitary Officer and Anaesthetist	.. —
Fairbairn, J., M.B. ..	India .. ..	.. ..	.. —
Foster, R. L. V., M.B.	Egypt .. ..	.. ..	.. —
Fraser, A. N., M.B. ..	Curragh .. ..	.. ..	.. —
Frost, A. T. ..	Aldershot .. ..	.. ..	.. —
Gatt, J. E. H., M.D. ..	Pretoria, South Africa ..	.. ..	.. —
Gray, A. C. H., M.B. ..	Uganda, East Africa ..	Seconded with Foreign Office	.. ..
Glanvill, E. M., M.B.	Standerton, South Africa	.. ..	.. —
Grant, M. F. ..	India .. ..	.. ..	.. —
Garland, F. J., M.B.	India .. ..	.. ..	.. —
Gater, A. W. ..	Woolwich .. ..	.. ..	.. —
Gibbon, T. H., M.D. ..	R.A.M. College	On probation	.. ..
Harding, N. E. J., M.B. ..	Shwabo, India .. ..	.. ..	.. —
Holden, C. W. ..	Returning to England, tour expired	.. ..	.. —
Harty, T. E. ..	Meerut, India .. ..	.. ..	.. —
Hughes, G. W. G. ..	.. ..	Attached Egyptian Army	.. ..
Harvey, N. D'E., M.B.	Wynberg, S. Africa ..	.. ..	.. —
Hanafin, P. J. ..	Pretoria, S. Africa ..	.. ..	.. —
Hildreth, H. C. ..	India .. ..	.. ..	.. —
Hole, R. B., M.B. ..	India .. ..	.. ..	.. —
Harding, H., M.B. ..	Karachi, India .. ..	.. ..	.. —
Hayes, G. S. C. ..	India .. ..	.. ..	.. —
Hills, W. H. ..	Netley .. ..	.. ..	.. —
Humfrey, R. E. ..	R.A.M. College	On probation	.. ..
Harvey, G. A. D. ..	Curragh .. ..	.. ..	.. —
Holbrooke, C. D. M. ..	R.A.M. College	On probation	.. ..
Hallowes, R. C., M.B.	Curragh .. ..	.. ..	.. —
Hoar, J. E. ..	R.A.M. College	On probation	.. ..
Hayes, A. H. ..	Peshawar, India .. ..	.. ..	.. —
Heron, G. W. ..	R.A.M. College	On probation	.. ..
Ievers, O., M.B. ..	St. Helena .. ..	.. ..	.. —
Johnstone, D. P. ..	Bangalore, India .. ..	.. ..	.. —
Jones, P. A. ..	Netley .. ..	.. ..	.. —
Kelly, W. D. C., M.B.	Sialkot, India .. ..	.. ..	.. —
Kelly, H. B., M.B. ..	Malapuram, India ..	Officer in charge Military Hospital	.. —
Kempthorne, G. A. ..	Aldershot	In charge Women and Children, Stanhope Lines	.. —
Longley, J. A., M.B.	Woolwich .. ..	.. ..	.. —
Le Bas, D. ..	Bloemfontein, S. Africa ..	.. ..	.. —
Lewis, R. R. ..	India .. ..	.. ..	.. —
Lucas, T. C. ..	India .. ..	.. ..	.. —
Long, H. W., M.B. ..	Jullundur, India	Staff Surgeon	.. ..
Lambert, F. C. ..	Pretoria, S. Africa ..	.. ..	.. —
Lewis, S. E., M.B. ..	Pretoria, S. Africa ..	.. ..	.. —

Name.	Station.	Appointment.	Specialist Certifi- cates in.
Luxmoore, E. J. H.	Netley		
Lynch, J. P.	Woolwich		
Low, N.	Aldershot		
Lithgow, E. G. R.	R.A.M. College	On probation	
McKenzie, J., M.B.	Calcutta, India		
Meadows, S. M. W.	Mian Mir, India		
Meldon, J. B.	Wellington, India	In charge Cordite Factory	
MacNicol, R. H., M.B.	Secunderabad, India		
McEntire, J. T., M.B.	Bloemfontein, S. Africa		
Mackay, G. S., M.B.	Pretoria, S. Africa		
MacDowell, W. MacD.	Mhow, India		
Moore, E. H. M.	Middelburg, Transvaal		
Meaden, A. A.	Mhow, India		
Mackenzie, J. F. C., M.B.	Netley		
Maydon, W. G., M.B.	R.A.M. College	On probation	
Millar, C. R.	Bordon		
McNeight, A. A., M.B.	R.A.M. College	On probation	
Maughan, J. St. A.	Netley		
Meredith, R. G., M.B.	R.A.M. College	On probation	
Noke, F. H.	India		
Nealor, W. S.	R.A.M. College	On probation	
Nash, R. P.	R.A.M. College		
Ommanney, F. M. M.		Seconded with Foreign Office	
Osburn, A. C.	India		
Ormrod, G., M.B.	R.A.M. College	On probation	
Otway, A. L., M.B.	Curragh		
O'Brien, C. W.	R.A.M. College	On probation	
Pennefather, E. M.	Secunderabad, India		
Patch, B. G.	Ambala, India		
Powell, J. E.	India		
Paton, D. D., M.D.	Netley		
Pascoe, J. S.	R.A.M. College	On probation	
Pallant, S. L.	Jubbulpore, India		
Power, P., M.B.	R.A.M. College	On probation	
Painton, G. R.	Deeput		
Parsons, W.	R.A.M. College	On probation	
Reed, G. A. K. H.	Jhansi, India		
Rutherford, R., M.B.	Deolali, India		
Rivers, W. C.	Kamptee, India		b.
Ranking, R. M.	Hong Kong, S. China		
Richmond, J. D., M.B.	Quetta, India		
Rugg, G. F.	Attached Egyptian Army		
Ryley, C.	Dublin		
Russell, H. W., M.B.	Curragh		
Rahilly, J. M. B., M.B.	R.A.M. College	On probation	
Richard, G. H.	Netley		
Roberts, F. E.	R.A.M. College	On probation	
Smallman, A. B., M.B.	Lebong, India		
Storrs, R.	Ambala, India		
Seccombe, J. W. S.			
Skelton, D. S.	Trincomali, Ceylon	In charge Women and Children	
Stanley, C. V. B., M.D.			
Swanzy, H. H.	Cawnpore, India	Staff Surgeon, in charge Departmental Followers' Hospital and Harness Factory	
Skey, J. F.	Middelburg, Transvaal		
Stack, H. T., M.B.	Lucknow, India		
Sinclair, M., M.B.	Aldershot		
Sidgwick, H. C., M.B.	Ewshott Camp	Officer in charge	
Tyndale, W. F., N.B., C.M.G.	Allahabad, India	Staff Surgeon, and in charge District Laboratory	
Tulloch, F. M. G.		Seconded with Foreign Office	
Tabuteau, G. G.	R.A.M. College	On probation	

Name.	Station.	Appointment.	Specialist Certifi- cates in.
Turner, F. J. ..	Colaba, India ..	.. ..	—
Thompson, R. J. C. ..	R.A.M. College ..	On probation ..	—
Thomson, D. S. B., M.B. ..	Dublin ..	.. ..	—
Thomson, C. P., M.D. ..	R.A.M. College ..	On probation ..	—
Turner, C. H. ..	Aldershot ..	.. ..	—
Turnbull, J. A. ..	Rawalpindi, India ..	.. ..	—
Thurston, L. V. ..	Woolwich ..	.. ..	—
Vaughan, W. F. H. ..	India ..	.. ..	—
Walker, N. D., M.B. ..	Quetta, India ..	.. ..	—
Webb, H. G. S. ..	Peshawar, India ..	.. ..	—
Winder, M. G. ..	Potchefstroom, S. Africa ..	.. ..	—
Wood, A. E. B., M.B. ..	Fyzabad, India ..	.. ..	—
Webster, J. A. W. ..	Secunderabad, India ..	In charge Cantonment Dispensary Trimulgherry & Military Prison	—
Wilmot, R. C. ..	Rangoon, India ..	In charge Followers' Hospital, and Staff Surgeon	—
Watson, D. P., M.B. ..	Bangalore, India ..	.. ..	—
Wetherell, M. C., M.B. ..	Rawalpindi, India ..	.. ..	—
Whitehead, E. C., M.B. ..	Aldershot ..	.. ..	—
Wiley, W., M.B. ..	India ..	.. ..	—
Wright, T. J. ..	India ..	.. ..	b.
Wilson, H. T. ..	Netley ..	.. ..	—
Winckworth, H. C. ..	Netley ..	.. ..	—
Wallace, G. S., M.B. ..	R.A.M. College ..	On probation ..	—

MEDICAL OFFICERS OF THE HOUSEHOLD CAVALRY.

Rank.	Name.	Regiment.	Station.	Specialist Certifi- cates in.
Surg.-Lieutenant-Colonel	Deeble, B. W. C. ..	1st Life Guards ..	Regent's Park ..	—
Surgeon-Major ..	Power, J. H. ..	2nd " " ..	Hyde Park ..	—
" " ..	Rayner, H., M.B. ..	Royal Horse Guards ..	Windsor ..	—
Surgeon-Captain ..	Cowie, R. M. ..	2nd Life Guards ..	Hyde Park ..	—
" " ..	Killery, St. J. B. ..	Royal Horse Guards ..	Windsor ..	—
" " ..	Pares, B. ..	1st Life Guards ..	Regent's Park ..	—

MEDICAL OFFICERS OF THE BRIGADE OF GUARDS.

Rank.	Name.	Regiment.	Station.	Specialist Certifi- cates in.
Brig.-Surg.-Lieut.-Col. ..	Harrison, C. E., M.B. ..	Grenadier Guards ..	London ..	—
Surg.-Lieutenant-Colonel	Crooke-Lawless, W. R., M.D. ..	Coldstream Guards ..	" ..	—
Surgeon-Major ..	Bateson, J. F., M.B. ..	" " ..	Windsor ..	—
" " ..	Kilkelly, C. E., M.B., C.M.G. ..	Grenadier Guards ..	Caterham ..	b.
" " ..	Moore, S. G. ..	Scots Guards ..	Aldershot ..	b.
" " ..	Sheldrake, E. N. ..	Grenadier Guards ..	London ..	—
" " ..	Whiston, P. H. ..	Irish Guards ..	Aldershot ..	b.

QUARTERMASTERS.

Rank.	Name.	Dates of				Present Station.	Date went abroad or arrived home.
		Birth.	Promotion to present rank.				
Major ..	Merritt, G. ..	23	6	1856	10 7 1889	S. Africa ..	24 12 1904
					Hon. Major 10 7 1904		
„ ..	Beach, J. H. W. ..	9	9	1857	8 1 1890	London ..	2 5 1903
					8 1 1900		
Captain	Bond, T. ..	24	12	1853	30 7 1890	Portsmouth ..	30 5 1902
					Hon. Capt. 30 7 1900		
„ ..	Thowless, E. ..	5	4	1851	24 12 1890	Woolwich ..	7 12 1902
					24 12 1900		
„ ..	Hirst, J. ..	23	2	1856	4 2 1891	Portsmouth ..	31 8 1902
					4 2 1901		
„ ..	Hewitt, M. ..	26	7	1850	22 4 1891	Curragh ..	29 11 1903
					22 4 1901		
„ ..	Goater, B. ..	9	10	1854	23 12 1891	Chester ..	5 7 1903
					23 12 1901		
„ ..	Lockhart, H. ..	6	8	1853	16 3 1892	Dublin ..	24 5 1903
					16 3 1902		
„ ..	Bere, C. ..	1	2	1852	11 1 1893	London ..	10 10 1902
					11 1 1903		
„ ..	Lines, E. ..	16	5	1855	4 10 1893	Malta ..	9 7 1902
					4 10 1903		
„ ..	Crawley, C. ..	7	5	1855	8 8 1894	Egypt ..	15 5 1903
					8 8 1904		
„ ..	Brake, T. F. ..	18	2	1859	5 9 1894	Dublin ..	23 5 1902
					5 9 1904		
„ ..	Short, J. B. ..	13	2	1860	12 9 1894	S. Africa ..	21 10 1899
					23 11 1900		
Lieut. ..	Hasell, H. G. ..	23	8	1860	17 4 1895	Canterbury ..	14 12 1902
„ ..	Dallas, D. ..	7	6	1854	17 4 1895	S. Africa ..	30 11 1899
„ ..	Mathews, J. ..	22	8	1855	25 3 1896	— ..	24 12 1904
„ ..	Finley, A. ..	18	3	1853	6 5 1896	Aldershot ..	9 11 1902
„ ..	Diggins, W. J. ..	26	8	1854	3 6 1896	S. Africa ..	24 12 1904
„ ..	Allen, G. L. ..	25	5	1856	9 6 1897	Malta ..	19 2 1903
Captain	Bruce, A. ..	4	8	1858	24 11 1897	Woolwich ..	13 2 1904
					Hon. Capt. 22 8 1902		
Lieut. ..	Macintosh, P. ..	12	10	1854	24 8 1898	Edinburgh ..	13 9 1902
„ ..	Hawkey, R. ..	12	9	1854	28 12 1898	Woolwich ..	16 11 1902
„ ..	Whitehorn, J. C. B. ..	27	2	1856	8 3 1899	Cork ..	24 3 1903
„ ..	Painton, G. H. ..	5	7	1855	24 6 1899	Depôt ..	10 9 1902
„ ..	Brook, H. S. ..	13	7	1856	12 7 1899	S. Africa ..	22 9 1899
„ ..	Spackman, H. ..	11	6	1860	4 10 1899	Netley ..	10 12 1904
„ ..	Chalk, A. J. ..	1	3	1861	18 11 1899	Dover ..	23 11 1902
„ ..	Green, J. ..	23	12	1859	18 11 1899	Devonport ..	21 6 1902
„ ..	Talbot, W. J. C. ..	25	10	1857	18 11 1899	York ..	28 12 1902
„ ..	Moss, E. P. ..	11	4	1859	18 11 1899	Hong Kong ..	22 8 1903
„ ..	Essex, B. E. ..	2	6	1860	6 12 1899	Colchester ..	9 9 1902
„ ..	McClay, J. ..	20	9	1858	6 12 1899	Woolwich ..	31 1 1906
„ ..	Short, G. F. ..	5	4	1862	6 12 1899	N. China ..	8 7 1904
„ ..	Woolley, H. ..	28	1	1864	13 12 1899	Gibraltar ..	12 11 1902
„ ..	Glennon, J. ..	10	6	1859	13 12 1899	Belfast ..	4 10 1902
„ ..	Ferguson, J. ..	10	12	1859	3 1 1900	Southampton	3 3 1902
„ ..	Hall, F. W. ..	26	4	1859	3 1 1900	Aldershot ..	7 12 1902
„ ..	Morrison, A. ..	16	5	1860	3 1 1900	S. Africa ..	22 9 1904
„ ..	Attwood, J. ..	16	12	1862	24 1 1900	Salisbury Plain	13 12 1902
„ ..	Duncan, W. ..	22	4	1859	24 1 1900	Netley ..	18 9 1902
„ ..	Roberts, R. O. ..	12	9	1858	24 1 1900	S. Africa ..	24 12 1904

¹ Seconded with S. African Constabulary.

² Seconded with Transvaal Medical Staff.

Rank.	Name.	Dates of		Present Station.	Date went abroad or arrived home.
		Birth.	Promotion to present rank.		
Lieut. ..	Bruce, F. ..	29 1 1859	3 2 1900	Dublin ..	19 11 1900
" ..	Holway, W. G. ..	8 11 1859	3 2 1900	S. Africa ..	22 9 1904
" ..	Offord, E. P. ..	3 5 1862	3 2 1900	Gosport ..	9 9 1902
" ..	Andus, H. J. F. ..	17 6 1860	3 2 1900	Alton ..	11 3 1900
" ..	Conolly, J. B. ..	7 8 1864	7 3 1900	Netley ..	10 9 1902
" ..	Houghton, E. ..	17 6 1859	17 3 1900	Dublin ..	7 12 1902
" ..	Scott, R. ..	5 11 1859	17 3 1900	Malta ..	15 10 1902
" ..	Wilson, A. ..	15 9 1864	17 3 1900	Hong Kong ..	2 11 1904
" ..	Glover, H. W. ..	10 2 1860	17 3 1900	Aldershot ..	6 5 1901
" ..	Exton, T. ..	11 8 1860	23 5 1900	" ..	30 8 1902
Captain	Crookes, F. ..	26 11 1861	23 5 1900	Devonport ..	10 12 1904
			Hon. Capt. 29 11 1900		
Lieut. ..	Cowan, R. R. ..	29 5 1862	30 5 1900	Dover ..	19 12 1903
" ..	Benson, G. A. ..	19 12 1862	2 6 1900	S. Africa ..	6 2 1901
" ..	Jacomb, T. J. ..	16 4 1861	2 6 1900	Chatham ..	18 3 1902
" ..	Wakefield, H. P. ..	11 2 1862	23 6 1900	S. Africa ..	23 6 1900
" ..	Wheeler, A. ..	1 4 1862	26 6 1900	Depôt ..	10 2 1905
" ..	Pilgrim, A. J. ..	23 6 1860	15 8 1900	London ..	31 8 1902
" ..	Lunney, A. ..	7 1 1864	16 2 1901	Portsmouth ..	10 2 1905
" ..	Clapshaw, A. ..	3 9 1859	13 3 1901	York ..	2 10 1902
" ..	Archibald, W. N. ..	8 9 1861	13 3 1901	Egypt ..	9 4 1903
" ..	Watkins, J. ..	29 5 1860	13 3 1901	S. Africa ..	1 5 1901
" ..	Gillman, J. ..	28 11 1862	11 1 1902	" ..	11 1 1902
" ..	Cope, T. F. ..	14 11 1861	11 1 1902	" ..	11 1 1902

¹ Specialist Certificate in Skiagraphy.

JOURNAL

OF THE

ROYAL ARMY MEDICAL CORPS.

Corps News.

JULY, 1904.

ROYAL ARMY MEDICAL CORPS.

The undermentioned Lieuts. are confirmed in that rank :—

F. C. Lambert, B. G. Patch, T. J. Wright, A. C. Osburn.

Lieut. N. E. Dunkerton, from the Seconded List, to be Lieut., dated May 2, 1904.

Lieut.-Col. R. C. Gunning retires on retired pay, dated May 25, 1904. He entered the Service February 4, 1877; was promoted Surg.-Major, February 4, 1889; Lieut.-Col., August 4, 1897; and Lieut.-Col., with higher rate of pay, under Art. 365 Pay Warrant, August 9, 1899. His war services are as follows: South African War, 1900-1902., P.M.O. of 22nd General Hospital: Operations in the Transvaal, September, 1901, to May 31, 1902. Operations in Cape Colony, May to June, 1901.

Lieut.-Col. J. T. Carey, M.B., retires on retired pay, dated May 25, 1904. He entered the Service February 4, 1877; was promoted Surg.-Major, February 4, 1889, and Surg.-Lieut.-Col., February 4, 1897. His war services are as follows: Afghan War, 1878-80: Assault and capture of the Peiwar Kotal. Mentioned in Despatches. Medal with clasp. Egyptian Expedition, 1882: Medal, bronze star.

Surg.-Major W. C. Bevor, M.B., C.M.G., from the Scots Guards, to be Major, with seniority next below R. J. A. Durant, dated May 25, 1904.

Capt. and Brevet-Major A. F. Tyrrell, from temporary half-pay, to be Capt. and Brevet-Major, dated May 11, 1904.

Lieut.-Col. W. Keays, F.R.C.S.I., retires on retired pay, dated June 11, 1904.

ARMY MEDICAL RESERVE OF OFFICERS.

Surg.-Capt. J. M. H. Martin, M.D., to be Surg.-Major, dated May 4, 1904.

Surg.-Major J. Adam, to be Surg.-Lieut.-Col., dated May 3, 1904.

Surg.-Capt. J. H. G. Whiteford, M.B., to be Surg.-Major, dated May 7, 1904.

IMPERIAL YEOMANRY.

Northumberland Hussars.—Surg.-Capt. A. Brumell, to be Surg.-Major, dated June 4, 1904.

Oxfordshire (Queen's Own Oxfordshire Hussars).—Surg.-Lieut. (Honorary Capt. in the Army) E. Hopkinson, M.B., D.S.O., resigns his Commission, dated June 4, 1904.

VOLUNTEER CORPS.

2nd Volunteer Battalion the Northumberland Fusiliers.—Supernumerary Surg.-Lieut. (Honorary Lieut. in the Army) J. Clay, M.B., to be Surg.-Capt., dated May 21, 1904.

1st Volunteer Battalion the Northamptonshire Regiment.—William Peart Thomas, Gent., to be Surg.-Lieut., dated May 21, 1904.

1st Volunteer Battalion the Manchester Regiment.—Surg.-Capt. W. F. O'Grady, to be Surg.-Major, dated June 4, 1904.

5th (Ardwick) Volunteer Battalion the Manchester Regiment.—Surg.-Major J. G. Saville resigns his Commission and is granted the honorary rank of Surg.-Lieut.-Col., with permission to wear the prescribed uniform, dated June 4, 1904.

1st Cadet Battalion the Queen's (Royal West Surrey Regiment).—Surg.-Lieut. A. C. Elliman to be Surg.-Capt., dated June 11, 1904.

3rd (The Blythwood) Volunteer Battalion the Highland Light Infantry.—Super-numerary Surg.-Major A. D. Moffatt to command the Highland Light Infantry Bearer Company, Royal Army Medical Corps (Volunteers), vice-Surg.-Major Q. Chalmers, 5th Volunteer Battalion the Highland Light Infantry, who has vacated the appointment, dated June 11, 1904.

5th (Glasgow Highland) Volunteer Battalion the Highland Light Infantry.—Super-numerary Surg.-Major Q. Chalmers is appointed Brig.-Surg.-Lieut.-Col., whilst holding the appointment of Senior Medical Officer to the Highland Light Infantry Volunteer Infantry Brigade, and to remain supernumerary, dated June 11, 1904.

1st (Ross Highland) Volunteer Battalion Seaforth Highlanders (Ross shire Buffs, the Duke of Albany's).—Surg.-Major J. Adam, M.D., to be Surg.-Lieut.-Col., dated June 11, 1904.

7th Volunteer Battalion the Gordon Highlanders.—Surg.-Lieut. J. F. Robertson, M.D., to be Surg.-Capt., dated June 11, 1904.

ROYAL ARMY MEDICAL CORPS VOLUNTEERS.

The Manchester Companies.—Lieut. W. R. Matthews, M.B., to be Capt., dated May 21, 1904.

Harry Washington Pritchard, Gent., to be Lieut., dated May 21, 1904.

3rd London Bearer Company.—Capt. E. Lloyd-Williams to be Major, dated June 4, 1904.

Wilts and Dorset Bearer Company.—Surg.-Major H. J. Mackay, M.B., from 2nd Volunteer Battalion the Duke of Edinburgh's (Wiltshire Regiment) to be Major, and to command, dated June 11, 1904.

Surg.-Capt. R. G. Worger, from 1st Volunteer Battalion the Prince Albert's (Somersetshire Light Infantry), to be Capt., dated June 11, 1904.

MEMORANDUM.

His Majesty the King has been graciously pleased to approve of the Bearer Company of the Lancashire Fusilier Volunteer Infantry Brigade being formed into an independent unit, to be designated the Lancashire Fusilier Bearer Company Royal Army Medical Corps (Volunteers).

ARRIVALS HOME.—From Somaliland: Majors J. W. Jennings, D.S.O., and H. N. Dunn. From West Africa: Major A. A. Sutton, D.S.O. From South Africa: Capt. A. E. Weld. From India: Lieut.-Col. T. F. MacNeece; Majors J. W. Bullen and R. W. Wright; Capt. F. F. Carroll. From Canada: Major J. R. Mallins.

ARRIVALS HOME ON LEAVE.—Lieut.-Cols. D. L. Irvine, G. J. Coates, A. F. Russell, J. Gibson, and G. T. Goggin; Majors R. C. Thacker, F. D. Elderton, and G. S. Crawford; Capts. E. T. F. Birrell, E. G. Ford, A. J. Chambers, G. S. Nickerson, H. Ensor, F. J. Palmer, J. M. Buist, and J. H. Robinson.

EMBARKATIONS.—West Africa: Capt. H. S. Taylor. South Africa: Lieut.-Col. W. Dugdale and Capt. H. W. H. O'Reilly.

POSTINGS.—Southern District: Major J. R. Mallins. North-Western District: Lieut.-Col. G. Wilson and Major J. W. Jennings, D.S.O.

EXCHANGES.—Col. G. A. Hughes, D.S.O., and Col. F. W. Trevor; Lieut.-Col. W. W. Pike, D.S.O., and Major T. J. Lenehan; Lieut.-Col. E. H. Lynden Bell and Major J. Moir.

ROYAL ARMY MEDICAL COLLEGE.—The undernamed Capts. have been selected to attend the course of instruction commencing about August 1st:—

H. W. Vaughan Williams, R. J. Blackham, H. Hewetson, J. McD. McCarthy, A. W. N. Bowen, H. G. Martin, F. F. Carroll, J. D. G. Macpherson, S. de C. O'Grady, A. H. O. Young, G. B. Carter, P. H. Collingwood, S. O. Hall, A. E. Weld, O. Challis, H. M. Nicholls, L. N. Lloyd, C. S. Smith, A. J. M. Cuddon-Fletcher.

Lieut.-Cols. G. E. Twiss and C. G. D. Mosse have been selected for increased pay under Art. 365 Pay Warrant.

Lieut.-Col. J. T. Carey, retired, has been appointed Recruiting Medical Officer at Manchester.

CORPS CASUALTIES (N.C.O.'s and men) from May 11 to June 10, 1904:—

Discharges.—9054 Pte. J. Horn, medically unfit, May 15, 1904; 6689 Pte. C. T. Bovey, after eighteen years, &c., May 18, 1904; 13546 Pte. H. McNinch, on payment of £18, May 23, 1904; 18370 Pte. J. Waring, on payment of £18, May 7, 1904; 12934 Lce.-Corpl. H. W. Hawkins, on payment of £18, March 24, 1904; 5461 Sergt. G. R. Calkinsopp, term. of 2nd period, May 30, 1904; 18721 Pte. A. E. Vaughan, medically unfit, May 31, 1904; 5445 Corpl. J. Michie, term. of 2nd period, April 25, 1904; 18201 Pte. F. A. Hockley, medically unfit, June 2, 1904; 8036 Pte. J. O'Leary, free after twelve years, May 28, 1904; 19050 Pte. A. C. Simmons, on payment of £10, June 2, 1904; 14287 Corpl. W. H. Chandler, on payment of £18, May 12, 1904; 9049 Corpl. T. Staughter, medically unfit, May 20, 1904; 5638 Pte. H. Dixon, after eighteen years, &c.; 19005 Boy H. H. Hutton, on payment of £10, June 6, 1904.

Transfers to other Corps.—14643 Pte. W. E. Currie to Royal West Surrey Regiment, April 30, 1904; 18441 Pte. W. Harris, Argyle and Sutherland Highlanders, May 17, 1904; 9984 2nd Cl. Staff-Sergt. F. C. Cross, Supernumerary with Egyptian Army, April 27, 1904; 18375 Pte. H. Knight to 11th Hussars, June 1, 1904.

Transferred to Army Reserve.—11157 Pte. J. M. B. Bradshaw, May 9, 1904; 11652 Pte. A. Barrett, April 30, 1904; 14630 Pte. F. Emmett, May 28, 1904; 15071 Pte. J. Champion, May 28, 1904; 14928 Pte. N. Barnett, May 28, 1904; 14817 Pte. C. Marsden, May 28, 1904; 14918 Pte. A. Isaacs, May 28, 1904; 15065 Pte. W. Gracey, May 28, 1904; 14914 Pte. A. Coad, May 28, 1904; 14929 Pte. P. Boyle, May 28, 1904; 14939 Pte. M. Wayman, May 28, 1904; 16453 Pte. C. F. Beech, May 28, 1904; 14920 Pte. J. Carvill, May 28, 1904; 15177 Pte. S. C. Eydmann, May 28, 1904; 14905 Pte. R. Churcher, May 28, 1904; 15021 Pte. J. Wright, May 28, 1904; 14865 Pte. N. Freshwater, May 28, 1904; 15723 Pte. J. Cartwright, May 21, 1904; 15767 Pte. F. Buxton, June 6, 1904; 15762 Pte. S. Craggs, June 3, 1904.

Embarkations and Disembarkations from Abroad.—From Singapore, April 30, 1904: 12785 Pte. C. H. Tanner, invalid. From Bermuda, May 31, 1904: 15204 2nd Cl. Staff-Sergt. H. A. Carter, invalid. From South Africa, May 27, 1904: 10047 2nd Cl. Staff-Sergt. C. A. Figg, 11690 Corpl. S. Sankey, 16453 Pte. E. F. Beech, 14929 Pte. P. Boyle, 14928 Pte. N. Barnett, 15071 Pte. J. Champion, 14920 Pte. J. Carvill, 14905 Pte. R. Churcher, 14914 Pte. A. Coad, 14950 Pte. J. Duffy, 15177 Pte. S. C. Eydmann, 14865 Pte. W. Freshwater, 15065 Pte. W. Gracey, 11824 Pte. C. C. Glendinning, 14918 Pte. A. Isaacs, 14817 Pte. C. Marsden, 8036 Pte. J. O'Leary, 14939 Pte. M. Wayman, 15021 Pte. J. Wright, 14944 Pte. H. W. Woodhouse, 9208 2nd Cl. Staff-Sergt. E. Edser, invalid; 15534 Pte. T. Beaufoy, invalid; 16201 Pte. R. J. Palmer, invalid; 15719 Pte. W. L. Stanley, invalid. June 7, 1904: 14793 Pte. C. E. Mason, 14805 Pte. E. Rowbotham, 14807 Pte. P. Draper. June 6, 1904: 8992 2nd Cl. Staff-Sergt. M. W. Colahan, 14904 Pte. G. W. Bonser, 14818 Pte. S. Breach, 14790 Pte. G. Burns, 14741 Pte. R. A. Mills, 14860 Pte. E. G. Pocock. To Bermuda, May 13, 1904: 9063 2nd Cl. Staff-Sergt. J. Bird, 14601 Corpl. G. Tuohy, 17538 Pte. J. Tomlinson, 12421 Pte. S. G. Churchill, 17930 Pte. M. Oliver, 10032 A. W. D. Hodsell, 18839 Pte. J. Young. To Halifax, Nova Scotia, May 13, 1904: 17505 Pte. F. E. Holden, 18509 Pte. J. McFarland, 18294 Pte. B. Finch, 14777 Pte. F. McOwen. To Barbados, May 25, 1904: 10127 Corpl. E. Lishmund, 18490 Pte. H. Cooper, 17730 Pte. P. Wills. To Sierra Leone, May 28, 1904: 11779 Sergt. G. Neenan, 9519 Pte. R. Partridge, 11109 Pte. F. W. Allen.

Deaths.—11019 Corpl. W. T. Meyer at Malta, May 21, 1904, disease, peritonitis; 8974 Pte. J. Smith at Netley, June 2, 1904, disease, dementia; 14942 Pte. F. J. Griffin at Kroonstad, South Africa, May 7, 1904, disease, enteric.

At the Railway Works at Swindon eight ex-N.C.O.'s of the Corps are employed as dispensers.

NOTES FROM SIALKOT.—The R.A.M.C. gave a silver cup for a Polo Tournament in April. Five teams entered, the senior team of the 3rd Hussars and 15th Lancers (Mooltanis) playing the final tie. It was a very fast game and resulted in a win for the Hussars.

Lieut.-Col. W. A. Morris and officers, R.A.M.C., were "at home," and Mrs. Morris presented the cup, which was much appreciated.

MALTA. CRICKET. GOVERNOR'S CUP TIE, R.A.M.C. v. A.S.C.—In the first round of the Governor's Cup Competition at Malta, the R.A.M.C. beat the A.S.C. by an innings and 28 runs. R.A.M.C., 237; A.S.C., 104 and 105. For the winners the

principal scorers were Capt. Bostock, R.A.M.C., 135; Sergt.-Major Green, 38; Pte. Hawes, 30. Capt. Kennedy, R.A.M.C., took 6 wickets for 43 runs; Pte. Hawes, 4 for 43; and Pte. Darby, 3 for 35. For the losers Lieut. Hollins, A.S.C., made 60, not out, and 43; Staff-Sergt. Rowley, 23. Lieut. Hollins, A.S.C., took 6 wickets for 80 runs.

No. 10 COMPANY R.A.M.C. CRICKET CLUB, CHATHAM:—

No. 10 COMPANY R.A.M.C. v. A.S.C.—This match was played on May 14 at Chatham, and resulted in a victory for the R.A.M.C. Scores: R.A.M.C., 68 1st innings and 68 for six wickets, declared, 2nd innings; A.S.C., 24 and 66.

No. 10 COMPANY R.A.M.C. v. DOCKYARD POLICE, CHATHAM.—Played at Chatham on May 21 and resulted in a victory for the R.A.M.C. after a most exciting game, by the narrow margin of 1 run. Scores: R.A.M.C., 64; Dockyard Police, 63.

No. 10 COMPANY R.A.M.C. v. A.P.C., CHATHAM.—This return fixture was played on May 28, with a victory for the R.A.M.C. Pte. Nicholas, R.A.M.C., bowled well, securing 6 wickets for 4 runs. Scores: R.A.M.C., 61; A.P.C., 32.

No. 10 COMPANY R.A.M.C. v. No. 12 COMPANY R.A.M.C.—This annual fixture was played at Woolwich on June 15, and resulted in a defeat for No. 10 Company by 3 runs—their first defeat this season. Scores: No. 12 Company R.A.M.C., 60; No. 10 Company, 57.

No. 10 Company have now played 6 matches, won 5, lost 1.

QUEEN ALEXANDRA'S IMPERIAL MILITARY NURSING SERVICE:—

Appointments: To be Staff Nurse, Miss B. Rennie, posted to Royal Victoria Hospital, Netley.

Retirements: Sister Miss A. Cameron, on pension.

Changes of Station:—

Sisters: Miss S. Lamming, Royal Herbert Hospital, Woolwich, to the Cadets' Hospital, Royal Military Academy, for temporary duty; Miss M. L. Potter, Hounslow to Dublin.

Matrons: Miss G. M. Richards, Woolwich to Devonport; Miss M. Wilson, Aldershot to Woolwich.

Appointments Confirmed:—

The undermentioned Sister and Staff Nurses are confirmed in their appointments, their periods of provisional service having expired:—

Sister: Miss J. M. Clay.

Staff-Nurses: Miss M. L. Harris, Miss E. J. M. Keene, Miss F. E. C. Watson.

NAVY NOTES.

INSPECTOR-GENERAL SIR HENRY NORBURY, Director-General of the Medical Department, will shortly be giving up that appointment, which he has held a little over six years. Sir Henry has served forty-four years, during which he has seen considerable active service in South Africa—in the Kaffir War, 1877-78, and in the Zulu War, 1879, on both occasions being mentioned in the despatches. For his services in the latter campaign he was promoted to Fleet-Surgeon and awarded the C.B. He was promoted to Deputy Inspector-General in 1887, and to Inspector-General in 1894, receiving three years later, on the occasion of the Diamond Jubilee of the late Queen Victoria, the K.C.B. Sir Henry is Honorary Surgeon to the King, Knight of Grace of the Order of St. John of Jerusalem, a Honorary Fellow of the Royal College of Surgeons, and the holder of Sir Gilbert Blane's gold medal.

INSPECTOR-GENERAL OF HOSPITALS AND FLEETS H. M. ELLIS, who has been selected to succeed Sir Henry Norbury, entered the Service in September, 1875, and served in the Egyptian War of 1882, when he was present at Kassassin and Tel-el-Kebir, being mentioned in despatches for his services and promoted to Staff-Surgeon. In 1891 he was promoted to Fleet-Surgeon, in which rank he served in the ill-fated battleship "Victoria," flagship of Vice-Admiral Sir George Tryon, which in June, 1893, was sunk off the Syrian coast. In August, 1899, he was promoted to Deputy Inspector-General, and in February last to Inspector-General, the following month being appointed to Haslar Hospital.

ROYAL ARMY MEDICAL COLLEGE LIBRARY AND READING ROOM, 68, VICTORIA STREET.

A SMALL but increasing library has been formed, and is deposited in No. 8 room, third floor, 68, Victoria Street, where a reading room has been equipped for the use of medical officers, subscribers to the Journal Fund, who are invited to avail themselves of it. The latest works on subjects of interest to the Army medical officer are to be found here. A list of books received is appended, but is not complete, as new books are being added.

Officers using the room, which is next to the Commandant's Office, will communicate with the issuer, Mr. Rowden, who is second clerk.

A volume at a time may be borrowed and taken away, but the officer so borrowing will sign a receipt for the volume, which will not be retained for longer than forty-eight hours. On returning it he will see his signature erased.

The reading room will be open from 10 a.m. to 5 p.m. daily, Sundays excepted, during which hours the issuer will be present.

LIST OF BOOKS.

Pathology and Bacteriology.

Centralblatt für Bacteriologie (broken series), 1892 to 1902, 5 vols.

Handbuch der Pathogenen Micro-organismen, 3 vols.

Atlas separate, 1 vol.

Annales de l'Institut Pasteur (broken series), 1894 to 1902.

Traite de Microbiologie, 4 vols.

Bakteriologie (Gunther), 1 vol.

Bacteriologische Diagnostik (Matzschita), 1 vol.

Die Thierische Parasiten des Menschen, 1 vol.

Clinical Pathology of the Blood (Ewing), 1 vol.

Bacteriological Technique (Eyre), 1 vol.

Post-mortem Pathology (Cattell), 1 vol.

Manual of Pathology (Coats), 1 vol.

Special Pathologic Histology (Burck), 2 vols.

The Practical Study of Malaria (Stephens and Christophers), 1 vol.

Die Malaria (Grassi), 1 vol.

Malariakrankheiten (Ruge), 1 vol.

Malaria und andere Blutparasiten (Ziemann), 1 vol.

Hygiene.

School Hygiene (Newsholme, Pakes), 1 vol.

Practical Sanitary Science, Part I. (Ventilating, Heating, Lighting), (Maxwell), 1 vol.

A Treatise on Hygiene and Public Health (Stevenson and Murphy), 2 vols.

Journal of Hygiene, 1901, 1 vol.

Zeitschrift für Hygiene (Koch and Flugge), 2 vols.

Statistik der Sanitätsverhältnisse, 1900 to 1902, 1 vol.

Thompson Yates Laboratories Report, 1898 to 1901, 1 vol.

Relazione Medico Statistica, 1 vol.

Surgery.

Theory and Practice of Surgery (Walsham and Spencer), 1 vol.

The Operations of Surgery (Jacobson and Steward), 2 vols.

Manual of Operative Surgery (Treves), 2 vols.

The Röntgen Rays in Medicine and Surgery (Williams), 1 vol.

Gray's Anatomy, Descriptive and Surgical, 1 vol.

Medicine.

The Diseases of Warm Countries (Scheube), 1 vol.

Text-book of Practical Therapeutics (Hare), 1 vol.

Oppenheim's Diseases of the Nervous System (Mayer), 1 vol.

A Text-book of Mental Diseases (Bevan Lewis), 1 vol.

The Principles and Practice of Medicine (Osler), 1 vol.

The Estivo-autumnal Malarial Fevers (Craig), 1 vol.

L'Hygiene des Tuberculeux (Chuquet), 1 vol.

Hygiene et Therapeutique Thermales (Delfau), 1 vol.

L'Hygiene du Dyspeptique (Linossier), 1 vol.

Medicine.

Hygiene des Maladies du Cœur (Vaquez), 1 vol.
 L'Hygiene des Albuminuriques (Springer), 1 vol.
 L'Hygiene des Syphilitiques (Bourges), 1 vol.
 L'Hygiene des Diabetiques (Proust and Mathieu), 1 vol.
 L'Hygiene des Neurastheniques (Proust and Ballet), 1 vol.
 L'Hygiene du Goutteux (Proust and Mathieu), 1 vol.
 L'Hygiene de l'obese (Proust and Mathieu), 1 vol.
 L'Hygiene des Asthmatiques (Brissaud), 1 vol.
 Les Cures Thermales (Delfau), 1 vol.

Special Subjects.

Diseases of Infancy and Childhood (Holt), 1 vol.
 Diseases of Women (Herman), 1 vol.
 Obstetrics (Williams), 1 vol.
 Diseases of the Nose and Throat (De Havilland Hall and Herbert Tilley), 1 vol.
 Otology (Brühl and Politzer), 1 vol.
 Diseases of the Ear (Poltzer), 1 vol.
 Text-book of Ophthalmology (Fuchs), 1 vol.
 Anæsthetics and their Administration (Hewitt), 1 vol.
 Medecine et Chirurgie Militaires, 1 vol.
 Hygiene et Therapeutique des maladies de la bouche (Cruet), 1 vol.

Miscellaneous.

German Official Account of the War in South Africa, 1 vol.
 The Nature of Man (Metchnikoff), 1 vol.
 British Medical Journal, 1887 to 1903, 35 vols.
 The Lancet, 1889 to 1903, 23 vols.
 Local Government Board Reports, 1880 to 1903 (2 vols, 1898 to 1899 and 1899 to 1900, missing), 24 vols.
 Report on the Medico-Military Arrangements of the Japanese Army in the Field, 1894-5, 1 vol.
 Manhattan Eye and Ear Hospital Reports, March, 1904, 1 vol.
 Report of the Commission on the Nature, Pathology and Prevention of Dysentery and its Relationship to Enteric Fever, 1900, 1 vol.

BIRTHS.

HODGENS.—On May 18, at New Castle, Jamaica, the wife of Capt. C. O'C. Hodgens, R.A.M.C., of a daughter.
 BEWLEY.—On June 8, at 22, Grosvenor Square, Rathmines, the wife of Major A. W. Bewley, R.A.M.C., of a daughter.

MARRIAGES.

BEAMISH—CHAPMAN.—On June 9, at St. Stephen's Church, South Dulwich, by the Rev. F. E. White, Vicar, Lieut. Col. Robert Talbot Beamish, late R.A.M.C., to Eveline Margaret, only daughter of Thomas Horatio Chapman, of "Hurstbourne," Sydenham Hill, Kent.
 ELLIS—CARTER.—On June 15, at St. Paul's Church, Avenue Road, N.W., by the Rev. Herbert Bury, Vicar, assisted by the Rev. G. W. Otten, of Lyme Regis, William Francis Ellis, R.A.M.C., fourth son of William Henry Ellis, of Shipley Hall, Yorkshire, to Catherine Mary, only child of the late J. Edwin Carter and of Mrs. Carter, of 157, King Henry's Road, N.W.
 HOSIE-WEBB.—On June 7, at St. John's, Waterloo Road, Lambeth, by the Rev. Herbert Sheppard, Major A. Hosie, M.D., R.A.M.C., to Sarah Emily, second daughter of the late Richard Webb, of Dunderrow House, Kinsale.
 ORMSBY—PIRIE.—At Christ Church, Colesberg, on May 4, by the Rev. C. Usher-Wilson, Rector, Capt. Gilbert J. A. Ormsby, R.A.M.C., only son of Sir Lambert Ormsby, President of the Royal College of Surgeons, Dublin, to Alice, third daughter of George Pirie, of "Leopard's Vlei," Richmond, and "Wonder Heuvel," Naauwpoort, Cape Colony.

DEATHS.

FOLLIOTT.—Brig.-Surg. W. Follicott (retired) died at Hove on June 8. He entered the Service October 1, 1862, as Assist. Surg. Staff, was appointed Assist. Surg. 106th Foot on November 17, 1863, and Assist. Surg. 20th Hussars, February 15, 1871. He was promoted Surg. A.M.D. on March 1, 1873, Surg.-Major, April 28, 1876, and Brig.-Surg., May 8, 1889. He retired on September 25, 1889. He served in India and China, and was present in the Afghan War, 1878-80, receiving the medal.

HAYMES.—Capt. H. E. Haymes, R.A.M.C., attached Egyptian Army, died at Tong, Upper Nile, on March 15, from pericarditis (following a bullet wound of head). Capt. Haymes entered the Service on January 28, 1899, and was seconded for service with the Egyptian Army on September 27, 1899.

LEAKE.—On June 1, 1904, at Boaz, Bermuda, Gwyneth Mabel Mary, infant daughter of Capt. J. W. Leake, R.A.M.C., aged five months.

ROYAL ARMY MEDICAL CORPS FUND.

APPENDIX TO MINUTES OF ELEVENTH MEETING.

THE following are in receipt of relief from the *Widows' and Orphans' Fund* :—

(1) Widow of a Private who died while on gratuity furlough; has one child and suffers from heart trouble. Receives £1 5s. monthly. Has received £14 10s. from Fund in all.

(2) Widow of pensioner. Has one son earning 8s. weekly. Pays 11s. a week for rent, and takes in lodgers. Receives £2 a month from Fund, to continue for twelve months from December 1, 1903. Recommended by P.M.O., Netley. Received £10 in all from Fund.

(3) Widow of Corporal. Has four children under 15 years of age. Receives £2 monthly from the Fund, which is paid through the P.M.O., N.W. District. Has received £17 in all from Fund.

(4) Widow of pensioner, aged 58. Recommended by Lieut.-Col. E. M. Wilson. Receives £1 10s. a month from Fund, from which source she has received £12 in all.

(5) Widow of a Private. Has three children. Earns about 4s. a week. Receives £1 a month from Fund, paid through P.M.O., E. District, Colchester. Received £8 in all from Fund.

(6) Widow of 1st Class Staff-Sergt. Has one daughter. Receives £1 monthly from the Fund. Has received £2 in all from Fund, paid through P.M.O. Home District.

(7) Widow, aged 64. Receives £1 10s. a month from Fund, paid through P.M.O. Home District. Has received £3 in all from Fund.

(8) Widow. Earns 7s. 6d. a week. No other assistance. Receives £1 10s. a month from Fund, paid through P.M.O., Dublin. Has received £4 10s. in all from Fund.

(9) Widow of 2nd Class Staff-Sergt. Has three children. Receives £2 a month, paid through P.M.O., Dublin. Has received £6 in all from Fund.

(10) A widow, aged 60, and unable to work. Receives £2 a month, paid through P.M.O., Dublin. Received £7 in all from Fund.

(11) Widow. Has three children. Receives £2 monthly from Fund, paid through O.C. 14th Coy. R.A.M.C. Has received £10 in all from Fund.

(12) Child of late 2nd Class Staff-Sergt. who died at Sierra Leone. £1 5s. a month paid to guardian through Mrs. Rochfort, Cahir Abbey. £8 2s. in all paid from the Fund.

(13) Widow with two children. Receives £2 a month, paid through the local clergyman. Has received £19 in all from the Fund.

(14) Widow. Receives £2 monthly, paid direct. Has received £28 in all from Fund.

(15) Widow of a private. Has received £2 monthly. Received £26 in all from Fund. Grant now discontinued.

GENERAL RELIEF FUND.

The following are in receipt of relief from this Fund :—

(1) Late M.S.C. Private, discharged medically unfit, "tubercle of lung," is married, with one child. Receives £2 a month from Fund. Has received £28 in all from Fund. Paid direct to man.

(2) Wife of a Private R.A.M.C., now serving in Ireland. Has one child. Husband is under compulsory stoppages for her support. Woman and child are being treated for chronic constitutional disease. Receives £2 a month from Fund. Has received £19 10s. in all from Fund, paid direct.

(3) Late Private. Has tubercular laryngitis. Tracheotomy performed. Is married. Receives 2s. 6d. a day pension. Cannot earn a living. Receives £1 10s. from Fund monthly. Has received £19 10s. in all from Fund. Paid through P.M.O., Chester.

(4) Wife of a Private R.A.M.C., serving in South Africa. Is delicate, and right arm has been amputated. Has a child, aged 7. Husband is under compulsory stoppages for her support. She receives £2 a month, and has received £15 in all from the Fund. Paid through P.M.O., Dublin.

(5) Husband in a lunatic asylum, late Private M.S.C. Receives £2 a month from Fund. Has received £6 in all from Fund. Is to be discontinued after the next grant. Paid through P.M.O., Cork.

*Aldershot,
April 8, 1904.*

(Signed) H. A. HINGE, *Capt.,
Hon. Sec. General Relief Fund.*

TWELFTH MEETING OF THE COMMITTEE.

The Twelfth Meeting of the Committee was held at 68, Victoria Street, S.W., on Tuesday, June 7, 1904, at 4 p.m.

Present.

Surg.-Gen. Sir William Taylor, K.C.B., K.H.P., Director-General A.M.S. (Chairman).

Surg.-Gen. H. Skey Muir, C.B.,	} Representing Retired Officers.
Lieut.-Col. E. Fairland,	
Lieut.-Col. J. F. Beattie,	
Surg.-Gen. W. H. McNamara, C.B., C.M.G.	
Surg.-Gen. A. H. Keogh, C.B.	
Col. A. T. Sloggett, C.M.G.	
Col. H. E. R. James.	
Lieut.-Col. E. M. Wilson, C.B., C.M.G., D.S.O.	
Lieut.-Col. R. H. Firth.	
Capt. G. St. C. Thom.	
Capt. and Quartermaster G. Merritt.	

(1) The Minutes of the Eleventh Meeting were confirmed.

(2) The Committee considered the draft, submitted by the Treasury Solicitor, of a deed for a trust to be called the de Chaumont Prize, and resolved that:—

(a) The Trust Fund should be invested, if possible, under the official designations of the Trustees, viz., the Director-General, for the time being, of the Army Medical Services, and the Commandant, for the time being, of the Royal Army Medical College. It is obvious that if invested in the names of the holders of the above offices the Trust will be liable to constant revision.

(b) Messrs. Holt and Co., having been asked to name three Trust securities suitable for the investment of this Fund, have submitted the following:—

East Indian Railway 3 per cent. Debenture Stock.
Southwark and Vauxhall Water 3 per cent. Debenture Stock.
Natal Government 3½ per cent. Stock, 1904-44.

Of these securities the Committee selects East Indian Railway 3 per cent. Debenture Stock, having ascertained that the Trustees holding this Stock may be registered under their official designations, omitting their names.

(c) The sum to be so invested should be £200 free of all expenses.

(d) In the event of there being no session of the College in any one or more half years for which the prize has been devised, the money for such prize should revert to the R.A.M.C. Fund.

(e) Should the purpose for which the Trust was created become extinct from any cause the Trust should cease, and the Trust moneys revert to the R.A.M.C. Fund.

(3) The Committee considered a report of its Sub-Committee presenting a scheme for memorials to distinguished officers. After some amendments the scheme was referred to the Sub-Committee for detailed recommendations as to the nature of the memorials which should be raised to the distinguished officers named.

(4) The Committee had before it certain proposals with regard to clerical arrangements for the administration of the Compassionate Fund, which it was agreed to postpone for another year.

(5) In the event of the reports of the Sub-Committees of the General Relief and Band Funds being presented some time before another meeting of this Committee is held, the Hon. Secretary was authorised to make payments on account to these Funds.

(6) The Committee approved of the following recommendations for admission of children to charitable schools being carried into effect:—

(i.) Boy W——, John, aged 9. Mother a widow, earning a precarious 10s. a week, is unable to contribute towards the education of the child. It is proposed to place him in St. Francis's Home, Shefford R.S.O., Bedfordshire. Inclusive cost of education and maintenance with clothing at that school is £20 per annum. The Rector of the mother's parish in Colchester recommends the school from personal knowledge as quite suitable.

(ii.) Boy R——, aged 8, is at present in St. Gabriel's School, Dublin. The mother wishes him admitted into the Royal Hibernian School, for which his name was entered four months ago. His name was submitted to the Governors on the 1st inst., but no information as to the result is available as yet. Should he not obtain admission it is desired to place him in the Orphanage of St. Vincent de Paul, Glasnevin, the charge for which would be £15 per annum (the lowest). The mother earns a precarious livelihood. The parish priest describes her as industrious but poor; four children. She is receiving monthly assistance from the Fund.

(iii.) Two girls, H——. Mother dependent on £2 per month given by the R.A.M.C. Fund, and on 7s. 6d. a week earned by her two elder children. It is desired to place the two younger, aged 11 and 12, in the Northampton Orphanage for Girls. Orphan girls may be admitted on payment in advance of £4 per quarter, for which the Institution undertakes to board, lodge and clothe them.

(7) The Hon. Secretary of the Aldershot Sub-Committee notified that the O.C. Depot, Aldershot, has paid £14 6s. 5d., mentioned at the last meeting, and also a further sum of £12 9s. 3d. from the sale of kits, to the General Relief Fund (Aldershot Account).

(8) The Director-General notified that Lieut.-Col. R. H. Forman, in addition to his annual subscriptions to the R.A.M.C. Fund, is making an additional annual subscription of £3 4s. for General Relief purposes, and that he was thanking Lieut.-Col. Forman for his generosity. The Committee expressed satisfaction at this intimation.

(9) H.R.H. Princess Christian expressed to the Director-General her gratification at the request of the R.A.M.C. Fund Committee that the Princess Christian Home for the R.A.M.C. should be dedicated to the memory of her son.

(10) The Director-General notified that the sum of £18 12s. 1d. had been paid for the erection of the Hamilton Memorial.

(11) The Director-General drew attention to the Colours now in use by the Corps. After some discussion, in the course of which it became evident that the present Colours were looked upon with general disapproval, the Committee agreed with the Director-General that the subject should be laid by him before the Corps at the general meeting about to be held, in order to obtain an expression of opinion from the whole Corps on the selection of new Colours.

(12) A report of the Dinner Sub-Committee was considered and approved. This report included proposals that the expenditure necessary for bringing plate for decorating the table for the Annual Dinner from the R.A.M.C. Mess at Aldershot and from the College in London be borne by the Fund; that the cost of the Dinner to subscribers shall be 12s. 6d., as in the last few years; and that a grant shall be voted from the R.A.M.C. Fund, sufficient together with the money standing to the credit of the old Dinner Fund to defray the total cost.

ROYAL ARMY MEDICAL CORPS DINNER.

THE Annual Dinner of the Corps took place at the Whitehall Rooms, Hotel Metropole, on June 18, 1904. The Director-General, Sir Wm. Taylor, K.C.B., K.H.P., presided. The following were present:—

Surgeon-Generals A. F. Bradshaw, C.B., K.H.P.; J. A. Clery, M.B., C.B.; C. McD. Cuffe, C.B.; W. J. Charlton; Sir J. Fayer, Bart., K.C.S.I., K.H.P.; Sir T. J. Gallwey, M.D., K.C.M.G., C.B.; A. Keogh, C.B.; T. Maunsell, C.B.; H. S. Muir, C.B.; W. H. McNamara, C.B.; A. F. Preston, K.H.P.; P. B. Smith; W. T. Stevenson, C.B.

Deputy Surgeon-Generals O. Codrington, W. G. Don, M.D.

Colonels G. D. Bourke; Sir J. R. A. Clark, Bart., C.B.; W. Donovan, C.B.; W. F. Hensman, C.M.G.; W. Johnston, M.D., C.B.; H. E. R. James; T. Ligertwood, M.D.; W. T. Martin, M.D.; J. Maturin; J. H. Moore; R. H. Quill, M.D.; W. J. R. Rainsford, C.I.E.; A. T. Sloggett, C.M.G.; F. W. Trevor.

Lieutenant-Colonels I. Anderson, M.D., C.I.E.; H. K. Allport, M.D.; T. Archer, M.D.; J. P. H. Borleau, M.D.; J. F. Beattie, M.D.; W. Babbie, V.C., C.M.G.; U. J. Bourke, M.D.; J. Battersby, M.D.; M. O'D. Braddell; A. F. S. Clarke, M.D.; A. B. Cottell; J. Carmichael; A. M. Davies; R. M. Ellis; R. W. Ford, D.S.O.; R. H. Firth; C. E. Fance; J. A. Gormley, M.D.; G. T. Goggin; F. A. Harris; A. P. Hart; H. W. Hubbard; L. Haywood; S. Hickson; W. T. Johnston, M.D.; C. W. M. Keys; G. E. Langridge, M.D.; J. Martin; E. L. Maunsell; G. H. Le Mottee, M.D.; C. G. D. Mosse; R. R. H. Moore; C. MacKinnon; F. B. Maclean; H. Martin; J. McLoughlin; C. W. S. Magrath; M. W. O'Keefe; R. F. O'Brien; A. Peterkin; W. W. Pope; W. W. Pike, D.S.O.; J. H. Reynolds, V.C.; J. I. Routh; G. W. Robinson; W. L. Reade; G. C. B. Robinson; J. M. Reid; W. W. H. Russell; C. Seymour; J. S. Sylvester; B. M. Skinner; G. E. Twiss; G. T. Trewman, M.B.; H. R. Whitehead; W. J. Wilson; C. A. Webb; E. M. Wilson; E. O. Wight; S. Westcott, C.M.G.; H. L. E. White.

Majors W. C. Beevor, C.M.G.; H. A. Cummins, C.M.G.; R. E. Cottell; T. H. F. Clarkson; S. H. Creagh; J. F. Donegan; W. S. Dowman; C. Walton; H. P. G. Elkington; J. S. Edye; S. F. Freyer, C.M.G.; N. C. Ferguson, C.M.G.; H. J. Fletcher; N. Faichnie; C. E. Freeman; J. Fayrer; F. G. Greig; C. Garner, M.B.; O. R. A. Julian, C.M.G.; C. L. Josling; J. C. Jameson; W. B. Leishman; T. McCulloch, M.B.; J. Moir, M.B.; J. D. Moir, M.D.; H. B. Matthias, D.S.O.; S. Macdonald; C. W. Melville; J. Meek; M. O. O'Halloran; J. J. O'Donnell; Parry; H. J. Peeke; W. H. Pinches; C. M. Pilcher, M.B., D.S.O.; A. Pearse; W. J. Rendell; C. Stonham, C.M.G.; W. H. Starr; G. D. Stainstreet; A. H. Sutton, D.S.O.; H. C. Thurston, C.M.G.; H. N. Thompson, D.S.O.; J. C. Weir; R. W. H. Jackson.

Surgeon-Major C. R. Killkelly, C.M.G.

Captains R. F. E. Austin; W. E. Berryman; E. T. F. Birrell; J. M. Buist; R. W. Clements; F. H. M. Clarke, M.B., C.M.G., D.S.O.; E. W. W. Cochrane; G. B. Carter; E. S. Clark; P. Evans; J. V. Forrest; C. E. P. Fowler; T. H. J. C. Goodwin; H. W. Grattan; H. A. L. Howell; H. A. Hinge; E. C. Hayes; T. P. Jones; G. A. Moore; A. J. MacDougall; A. H. Morris; J. R. McMunn; G. S. Mansfield, M.B.; M. M. Rattray; L. F. Smith; G. B. Steel; J. C. B. Statham.

Lieutenant F. Tulloch.

There were also present Sir E. Cooper Perry, M.D., Dr. J. Galloway, and Vesey Holt, Esq.

EXTRACT FROM "PITMAN'S PHONETIC JOURNAL."

Page 442 of the issue dated June 4, 1904.

"The Pitman silver medal for best transcript of speed test at 150 words per minute, offered in connection with the Dublin Shorthand Association for competition at the examination held on April 27, has been awarded to Soldier-Clerk James McDonald."¹

COLLECTING SPECIMENS FOR THE BRITISH MUSEUM.

OFFICERS of the Royal Army Medical Corps, on foreign service, who are interested in Natural History, and would be willing to make their hobby of service to the National Museum by collecting specimens, are invited to communicate on the subject to The Director, British Museum (Natural History), Cromwell Road, London, S.W.

Specimens of all classes are wanted, even from places which may be supposed to be well explored. Small mammals, fresh-water fish, earthworms, scorpions and spiders are wanted even from the best-known localities, and in all groups something still remains to be done.

When communicating it should be stated in which group the writer is most interested, and his letter would then be put in the hands of the specialist on that

¹ This refers to No. 17619 Pte. J. McDonald, No. 14 Coy., Dublin.

subject, who would correspond with him and send him directions as to what species to look out for and how to prepare his specimens.

If no special group is mentioned, the Director will make suggestions as to which are likely to be the most productive subjects to be taken up.

Donors of specimens will be refunded the expense of postage and freight of all specimens obtained at the request of the Museum authorities or accepted by them.

Mr. A. Smith Woodward, F.R.S., Keeper of the Geological Section, will be much pleased to have the opportunity of seeing any officer of the Corps, interested in geology, who is going abroad. Fossils from all parts of the world are wanted.

THE BRITISH MEDICAL ASSOCIATION MEETING.

This Meeting takes place at Oxford on the 26th, 27th, 28th, and 29th July, 1904. The Navy, Army, and Ambulance Section will be presided over by Surg.-Gen. A. F. Bradshaw, C.B., K.H.P. It is hoped that there will be a good muster of the Officers of the Corps and that they will take part in the proceedings of the Section. Officers who have promised papers are reminded that short abstracts of their papers should be sent at once to the Hon. Secretary, Major T. McCulloch, R.A.M.C., 68, Victoria Street, S.W., and also that the text of the papers should be handed in immediately after they have been read, or, at the latest, at the end of the day's meeting of the Section.

NOTICE.

The Corps News is now printed as an inset to the Journal and separate copies may be subscribed for, price 2d. monthly.

JOURNAL

OF THE

ROYAL ARMY MEDICAL CORPS.

Corps News.

AUGUST, 1904.

ROYAL ARMY MEDICAL CORPS.

The undermentioned Lieuts. to be Capts. :—

R. C. Wilson, dated May 3, 1904.

E. G. Ffrench, M.B., dated May 28, 1904.

P. G. Hyde, dated June 22, 1904.

A. McMunn, dated June 25, 1904.

ROYAL HOSPITAL, CHELSEA.

Surg. T. Ligertwood, M.D., C.B., from Surg. on the half-pay list, retires on retired pay, dated June 3, 1904.

Lieut.-Col. C. Seymour, M.B., R.A.M.C., to be Physician and Surg., vice T. Ligertwood, M.D., C.B., retired, dated June 3, 1904.

Major J. W. F. Long retires on retired pay, dated July 9, 1904.

Quarter-Master and Honorary Capt. G. Merritt to be Honorary Major, dated July 10, 1904.

The following results of examinations of Majors for the rank of Lieut.-Col. are notified for general information.

The undermentioned have qualified in "Army Medical Organisation," "Sanitation and Epidemiology," and "Special Subject" :—

Lieut.-Cols. T. B. Winter, G. F. Gubbin.

Majors J. Maher ; G. D. Hunter, D.S.O. ; H. N. Thompson, M.E., D.S.O. ; N. Manders ; R. S. F. Henderson, M.B. ; C. W. Johnson, M.B. ; A. T. I. Lilly ; C. C. Reilly ; A. de Scanlan ; W. Turner ; W. E. Berryman ; S. E. Duncan ; F. W. C. Jones, M.B. ; G. G. Adams ; J. M. F. Shine, M.D. ; S. R. Wills ; M. L. Hearn ; J. H. Greenway ; R. G. Hanley, M.B. ; J. H. Curtis ; J. S. Green, M.B. ; L. T. M. Nash ; J. H. Daly ; T. Daly ; M. J. Sexton, M.D. ; A. A. Sutton, D.S.O. ; F. W. G. Hall, M.B. ; J. B. W. Buchanan, M.B. ; J. J. O'Donnell, M.B. ; T. H. F. Clarkson ; G. H. Barefoot ; B. H. Scott ; J. W. Cockerill ; J. Ritchie, M.B. ; D. Stiehl, M.D. ; J. C. Weir, M.B. ; E. M. Hassard ; J. Thomson, M.B. ; H. S. Peeke ; A. L. Borradale, M.B.

The following Majors have qualified in the subjects stated against their names :—

H. C. Thurston, C.M.G., "Army Medical Organisation" and "Sanitation and Epidemiology."

A. O. C. Watson, M.B., "Sanitation and Epidemiology" and "Special Subject."

G. Raymond, M.B., "Army Medical Organisation" and "Special Subject."

The following have qualified in Subject "h" for the rank of Capt. :—

Captains J. B. Clarke, M.B. ; D. L. Harding ; R. C. Wilson ; E. G. Ffrench, M.B. ; P. G. Hyde, M.B. ; A. McMunn. Lieuts. F. W. Lambelle, M.B. ; M. C. Beatty, M.B. ; T. F. Ritchie, M.B. ; A. W. Sampey (Special Certificate) ; T. J. Potter ; A. J.

Williamson, M.B.; E. V. Ayles; H. Rogers, M.B.; W. Davis; D. J. F. O'Donoghue; P. Davidson, M.B., D.S.O.; H. G. S. Webb.

The following have passed the qualifying examination in "Military Law" for the rank of Lieut.-Col. :—

Lieut.-Cols. T. B. Winter, F. S. Heuston, C.M.G.

Majors N. Manders; S. F. Freyer, M.B., C.M.G.; R. S. F. Henderson, M.B.; J. R. Forrest ("D"); C. C. Reilly; W. E. Berryman; S. E. Duncan; S. Powell, M.B. ("D"); G. G. Adams; J. M. F. Shine, M.D.; C. T. Blackwell, M.D.; N. C. Ferguson, M.B., C.M.C.; J. H. Greenway; J. H. Curtis; L. T. M. Nash; J. H. Daly; M. J. Sexton, M.D.; A. A. Sutton, D.S.O.; M. T. Yarr; B. L. Mills, M.D.; J. G. Black, M.D.; F. A. Saw, M.B.; J. J. O'Donnell, M.B.; J. S. Davidson, M.B.; A. R. Aldridge, M.B.; R. J. C. Cottell; M. J. Whitty, M.D.; G. F. H. Marks, M.D.; E. M. Hassard; A. E. Smithson, M.B.; R. J. W. Mawhinny; G. W. Tate, M.B.; C. B. Lawson, M.B.

Captains H. S. Thurston, E. B. Steel, M. W. Faulkner, M. F. Foulds, S. A. Archer.

For the rank of Captain: Captains J. B. Clarke, M.B.; D. L. Harding; R. C. Wilson; E. G. French, M.B.; P. G. Hyde, M.B.; A. McMunn. Lieuts. F. W. Lambelle, M.B.; M. C. Beatty, M.B.; T. F. Ritchie, M.B.; A. W. Sampey ("D"); T. J. Potter; A. J. Williamson, M.B.; E. V. Ayles; H. Rogers, M.B.; W. Davis; D. J. F. O'Donoghue; P. Davidson, M.B., D.S.O.; H. G. S. Webb.

ROYAL ARMY MEDICAL CORPS (MILITIA).

Capt. J. E. O'Connor, M.B., resigns his commission, dated July 2, 1904.

Supernumerary Lieut. S. G. McAllum, M.D., to be Capt., dated June 4, 1904.

ARMY MEDICAL RESERVE OF OFFICERS.

Surg.-Lieut. V. Graham to be Surg.-Capt., dated June 5, 1904.

Surg.-Major E. J. Hunter to be Surg.-Lieut.-Col., dated June 14, 1904.

Capt. F. D. Woolley, R.A.M.C. Volunteers to be Surg. Capt., dated June 4, 1904.

Surg.-Lieut. J. R. Williams, M.B., 3rd Volunteer Battalion Royal Welsh Fusiliers, to be Surg.-Lieut., dated June 4, 1904.

Surg.-Lieut. G. R. Livingstone to be Surg.-Capt., dated June 5, 1904.

Surg.-Major F. K. Pigott to be Surg.-Lieut.-Col., dated June 21, 1904.

Brigade-Surg.-Lieut.-Col. W. P. Whitcomb, Worcester and Warwick Volunteer Infantry Brigade, to be Surg.-Major, dated July 6, 1904.

Surg.-Lieut. L. A. Avery, Suffolk Imperial Yeomanry, to be Surg.-Lieut., dated July 6, 1904.

IMPERIAL YEOMANRY.

Glamorganshire.—Colin Campbell McCall, Gent., to be Surg.-Lieut., dated May 23, 1904.

The following announcement is substituted for that which appeared in the *London Gazette*, dated June 3, 1904.

Alexander George Lovett-Campbell, M.B., to be Surg.-Lieut., dated May 28, 1904.

South of Ireland.—The appointment of Surg.-Lieut. F. F. MacCabe, M.B., bears date July 30, 1903, and not as stated in the *London Gazette*, dated September 18, 1903.

ROYAL ARMY MEDICAL CORPS (VOLUNTEERS).

(The Woolwich Companies).—Lieut. E. B. Dowsett to be Capt., dated June 18, 1904.

Argyll and Sutherland Bearer Company.—William Cochrane Murray, M.B., to be Lieut., dated June 25, 1904.

To be ordinary Members of the Military Division of the Third Class, or Companions of the Most Honourable Order of the Bath: Hon. Col. John Edward Squire, late Commanding Home District Royal Army Medical Corps, Volunteers (London Companies).

The London Companies.—Capt. J. Harper to be Major, dated May 28, 1904.

Gloucester and Somerset Bearer Company.—David Brynmor Chiles-Evans to be Lieut., dated May 28, 1904.

North East Lancashire Bearer Company.—Capt. J. M. H. Martin, M.D., to be Major, dated May 28, 1904.

4th or City of London Bearer Company.—John Forbes, Gent., to be Lieut., dated May 28, 1904.

Welsh Bearer Company.—Major C. Downing to be Brigade-Surg.-Lieut.-Col., whilst holding the appointment of Senior Medical Officer to the Welsh Volunteer Infantry Brigade, dated January 23, 1904.

The Aberdeen Company.—Major J. Mac-K. Booth, M.D., resigns his Commission, with permission to retain his rank and to wear the prescribed uniform, dated July 2, 1904.

The Woolwich Companies.—Lieut. J. Hardie, M.B., to be Capt., dated July 9, 1904. Quarter-Master M. Mutimer resigns his Commission, dated July 9, 1904.

The undermentioned gentlemen to be Quarter-Masters: Walter Thomas Lomax, dated July 9, 1904; Alfred Jeffery Messent, dated July 9, 1904.

Welsh Bearer Company.—Capt. A. W. Sheen, M.D., is appointed to command, dated July 9, 1904.

VOLUNTEER CORPS.

Submarine Miners the Clyde Division.—Surg.-Capt. J. H. G. Whiteford, M.B., to be Surg.-Major, dated June 18, 1904.

2nd Volunteer Battalion the East Lancashire Regiment.—Surg.-Lieut. C. W. Crawshaw, M.B., to be Surg.-Capt., dated June 18, 1904.

2nd Volunteer Battalion the Sherwood Foresters (Nottinghamshire and Derbyshire Regiment.)—John Buckley, Gent., to be Surg.-Lieut., dated June 18, 1904.

Royal Garrison Artillery (Volunteers), 4th Durham.—Surg.-Lieut. J. S. Milne, M.B., to be Surg.-Capt., dated June 25, 1904.

Royal Engineers (Volunteers), East London (Tower Hamlets).—Surg.-Lieut. J. S. Edwards to be Surg.-Capt., dated June 25, 1904.

Rifle Volunteers, 2nd Volunteer Battalion the Northumberland Fusiliers.—Surg.-Lieut. F. W. Grinling is borne as Supernumerary whilst commanding the Tyne Volunteer Infantry Brigade Bearer Company, dated June 25, 1904.

2nd Volunteer Battalion the Lancashire Fusiliers.—Lieut. J. A. C. Roy resigns his Commission, and is appointed Surg.-Lieut., dated June 25, 1904.

3rd Volunteer Battalion the Welsh Regiment.—Evan James Trevor Jones, M.D., to be Surg.-Lieut., dated June 25, 1904.

13th Middlesex (Queen's Westminster).—Surg.-Lieut. J. S. Hudson to be Surg.-Capt., dated June 25, 1904.

2nd Volunteer Battalion the York and Lancaster Regiment.—Surg.-Lieut. V. Graham to be Surg.-Capt., dated June 25, 1904.

5th Irish Volunteer Battalion (The King's Liverpool Regiment).—Surg.-Lieut.-Col. D. E. Flinn resigns his Commission, and is granted the honorary rank of Surg.-Col., with permission to wear the prescribed uniform, dated May 28, 1904.

Surg.-Lieut. J. G. Moyles, M.B., resigns his Commission, dated May 28, 1904.

Lieut. H. M. Bayer resigns his Commission, and is appointed Surg.-Lieut., dated May 28, 1904.

John Mauries Ahern, Gent., to be Surg.-Lieut., dated May 28, 1904.

1st Volunteer Battalion the Northamptonshire Regiment.—Surg.-Lieut. H. S. Baker to be Surg.-Capt., dated May 28, 1904.

2nd (South) Middlesex.—Surg.-Capt. Edmund Percival Isaacs is permitted to change his name to Edmund Percival Isaacs Coke.

4th Volunteer Battalion the Manchester Regiment.—Capt. and Honorary Major John Crawhall Nichol, retired, to be Surg.-Lieut., dated May 28, 1904.

5th (Glasgow Highland) Volunteer Battalion the Highland Light Infantry.—Supernumerary Brig.-Surg.-Lieut.-Col. D. Cowie, M.B., Senior Medical Officer Highland Light Infantry, Volunteer Infantry Brigade, resigns his Commission, and is granted the honorary rank of Surg.-Col., with permission to wear the prescribed uniform, dated May 28, 1904.

2nd Volunteer Battalion the Highland Light Infantry.—Surg.-Capt. W. Sandeman, M.B., to be Surg.-Major, dated July 2, 1904.

18th Middlesex.—Major and Honorary Lieut.-Col. A. H. Morgan, D.S.O., retired, late Army Medical Staff, resigns his Commission, with permission to retain his rank and to wear the prescribed uniform, dated July 2, 1904.

ROYAL GARRISON ARTILLERY VOLUNTEERS.

1st Glamorganshire.—Francis Griffith Thomas, Gent., to be Surg.-Lieut., dated July 9, 1904.

8th Lancashire.—Charles Edwin Maximilian Lowe, Gent., to be Surg.-Lieut., dated July 9, 1904.

RIFLE VOLUNTEERS.

3rd Volunteer Battalion the Devonshire Regiment.—Surg.-Capt. W. Langran resigns his Commission, dated July 9, 1904.

1st (Hertfordshire) Volunteer Battalion the Bedfordshire Regiment.—Surg.-Lieut. H. H. L. Patch to be Surg.-Capt., dated July 2, 1904.

2nd (Berwickshire) Volunteer Battalion the King's Own Scottish Borderers.—Surg.-Capt. S. Macvie, M.B., to be Surg.-Major, dated July 9, 1904.

2nd Volunteer Battalion the Durham Light Infantry.—Brig.-Surg. Lieut.-Col. T. A. McCullagh resigns his Commission, and is granted the honorary rank of Surg.-Col.,

with permission to wear the prescribed uniform, vacating at the same time the appointment of Senior Medical Officer to the Durham Light Infantry, Volunteer Infantry Brigade, dated July 9, 1904.

ARRIVALS HOME.—From Somaliland: Capts. S. de C. O'Grady and S. O. Hall. From Gibraltar: Lieut.-Col. A. P. O'Connor, C.B. From West Africa: Capt. A. G. Thompson.

ARRIVALS HOME ON LEAVE.—Col. W. A. May, C.B.; Lieut.-Cols. C. B. Hill and R. Jennings; Majors R. J. D. Hall, H. J. M. Buist, D.S.O.; I. A. O. MacCarthy, A. P. Blenkinsop, C. H. Melville; Capts. E. T. Inkson, V.C.; H. C. R. Hime, S. G. Butler, A. E. Thorpe, R. N. Hunt and H. Herrick; Lieut. W. B. Taylor.

EMBARKATIONS.—South Africa: Major T. J. Lenehan and Capt. L. Addams-Williams. Malta: Lieut.-Col. J. H. A. Rhodes and Major J. M. Nicolls. Hong Kong: Major Ch. Josling. India: Col. F. W. Trevor.

POSTINGS.—Majors J. W. Bullen, R. Crofts, D.S.O., and D. D. Shanahan; Capt. J. H. Brunskill to Ireland. Major R. W. Wright to Southern District. Lieuts. D. S. B. Thomson, J. H. Douglass, A. L. Otway, D. P. Johnstone, M. D. Ahern to Ireland. Lieuts. M. F. Grant, J. A. Turnbull, A. A. Meaden, J. Fairbairn, G. F. Rugg, R. B. Hole, H. Harding and H. B. Connell to Woolwich. Lieuts. A. S. Arthur, D. Le Bas, R. R. Lewis, W. Wiley, F. J. Garland and R. J. Cahill to Netley. Lieuts. R. M. Ranking, L. Bousfield, C. H. Turner, G. E. Cathcart, E. C. Whitehead, T. C. Lucas, W. F. H. Vaughan and R. H. M. Moore to Aldershot.

The following is the distribution of the Capts. at the termination of the course at the R.A.M. College:—Eastern District: S. W. Sweetnam; North Western District: W. S. Harrison, H. W. Grattan and R. W. Clements; South-Eastern District: S. H. Faivre and J. N. Campbell; Southern District: G. T. K. Maurice and A. H. Waring; Netley: J. C. B. Statham; Home District: E. C. Hayes and T. A. M. Clarke, C.M.G., D.S.O.; Ireland: E. W. W. Cochrane and E. A. Bourke; Thames District: A. H. Morris; Aldershot: G. B. Riddick and A. C. Lupton; Scottish District: A. J. MacDougall; North-Eastern District: M. Swabey and C. N. Hopkins; Salisbury Plain: W. E. Hudleston; Western District: E. W. P. V. Marriott.

D.P.H. Examination.—Capt. D. J. Collins, R.A.M.C., was a successful candidate at the recent Examination for D.P.H. at the Royal University of Ireland.

POSTINGS ABROAD.

It is notified for general information that the undermentioned Officers will be required to proceed to the commands specified during the coming trooping season.

As soon as the programme of sailings of transports is known, Officers will be informed of the probable dates of their embarkations, and definite orders will be issued through the usual channels.

Officers of the same rank ordered to different foreign stations may, by mutual arrangement, have their stations altered, but it must be clearly understood that, while the Director-General is anxious to meet Officers' wishes, it is not always possible to give effect to them. Applications for alteration of station or for exchanges of position on the roster for service abroad should be submitted as early as possible.

Rank and Name	Command	Rank and Name	Command
Lieut.-Col. G. F. A. Smythe ..	Bengal	Major W. H. Pinches ..	Bengal
" L. W. Swabey ..	Bombay	" H. D. Rowan ..	Punjab
" R. H. S. Sawyer ..	Punjab	" J. Kearney ..	Bombay
" W. L. Reade ..	Madras	" F. A. Saw ..	Madras
" W. W. Pike, D.S.O. ..	"	" A. Kennedy ..	Bengal
" J. D. T. Reckitt ..	Punjab	" W. P. Squire ..	Punjab
" E. H. Lynden-Bell ..	Bengal	" H. W. Austin ..	Bombay
" C. E. Faunce ..	Bombay	" M. J. Whitty ..	Madras
" R. J. Geddes, D.S.O. ..	Bengal	" H. A. Cummins, C.M.G. ..	Punjab
" G. Wilson ..	Punjab	" H. B. Mathias, D.S.O. ..	"
Major W. C. Beevor, C.M.G. ..	Bombay	" G. Bent ..	Bengal
" A. E. C. Spence ..	Madras	" J. S. Edye ..	Bombay
" N. Manders ..	Punjab	" G. Scott ..	Punjab
" H. A. Haines ..	Bengal	" W. T. Dowman ..	Bengal
" G. M. Dobson ..	Punjab	" J. P. S. Hayes ..	"
" H. J. Fletcher ..	Bombay	" E. A. Burnside ..	Madras
" N. C. Ferguson, C.M.G. ..	"	" A. Y. Reily ..	"
" R. H. Hall ..	Punjab	" M. P. C. Holt, D.S.O. ..	Punjab

Rank and Name	Command	Rank and Name	Command
Major A. L. F. Bate	Bombay	Lieut.-Col. C. W. S. Magrath ..	S. Africa
" H. E. Winter	"	" F. H. M. Burton	"
" G. S. McLoughlin, D.S.O. ..	"	Major W. T. Swan	"
" G. A. T. Bray	Bengal	" C. T. Blackwell	"
" C. Dalton	Punjab	" M. O'Halloran	"
" C. W. Duggan	Madras	" S. F. Clark	"
" H. D. Mason	Bengal	Capt. J. R. McMunn	"
Capt. T. McDermott	"	" K. B. Barnett	"
" R. F. E. Austin	"	" C. M. Fleury	"
" N. Marder	"	" O. Challis	"
" G. S. Mansfield	Madras	Lieut. F. W. W. Dawson	"
" H. W. K. Read	Bengal	" F. C. Lambert	"
" J. B. Anderson	"	" J. S. Skeay	"
" H. V. Prynn	Bombay	" T. S. Dudding	"
" E. S. Clark	Punjab	" O. Ievers	"
" P. Evans	Bengal	" H. H. J. Fawcett	"
" S. W. Sweetnam	Madras	" N. D. E. Harvey	"
" F. Kiddle	Bombay	" S. E. Lewis	"
" M. M. Rattray	"	" J. T. McEntire	"
" J. G. Berne	"	" P. J. Hanafin	"
" A. C. Lupton	Punjab	" E. M. Glanvill	"
" J. S. Gallie	Madras	" A. C. Wetherell	"
" L. N. Lloyd, D.S.O.	Bengal	" G. S. Mackay	"
" C. S. Smith	Bombay	" R. T. Collins	"
" A. J. M. Cuddon-Fletcher ..	Punjab	" A. C. Osburn	"
" J. H. Brunskill	Madras	" E. C. Whitehead	"
Lieut. A. B. Smallman	"	" E. H. M. Moore	"
" W. F. Ellis	Punjab	" M. D. Ahern	"
" B. G. Patch	"	" G. S. C. Hayes	"
" D. P. Watson	Madras	" A. A. Meaden	"
" J. E. Powell	Bengal	" R. J. Cahill	"
" R. H. MacNicol	Madras	Major F. S. Le Quesne, V.C. ..	Malta
" S. L. Pallant	Bengal	" W. J. Trotter	"
" C. R. Bradley	Bombay	Capt. C. E. Pollock	"
" G. A. Kempthorne	Punjab	" A. E. Master	"
" F. M. G. Tulloch	Madras	" John M. Buist	"
" J. D. Richmond	Bombay	Lieut. J. H. Duguid	Straits Settlements
" H. C. Hildreth	Bengal	Lieut.-Col. H. C. Kirkpatrick ..	Barbados
" W. M. MacDowall	Bombay	Capt. J. P. Silver	"
" T. J. Wright	Madras	Major P. C. H. Gordon	Mauritius
" F. J. Turner	Bombay	Capt. H. E. Staddon	"
" T. C. Lucas	"	" M. Boyle	Bermuda
" J. A. Turnbull	Punjab	" S. F. St. D. Green	"
" W. Wiley	Madras	Lieut. R. M. Ranking	Hong Kong
" R. B. Hole	Bombay	Major J. F. Donegan	Egypt
" A. L. Otway	"	Capt. C. K. Morgan	"
" W. F. H. Vaughan	Madras	Major C. A. Lane	Ceylon
" M. F. Grant	Bombay	Capt. D. Lawson	"
" H. Harding	"	Capt. F. M. Mangin	Jamaica
" D. P. Johnstone	Madras	Major T. du B. Whaite	Gibraltar
" F. J. Garland	Bombay	Brevet-Major A. F. Tyrrell ..	"
" H. B. Connell	"	Capt. H. A. Berryman	"
Lieut.-Col. W. J. Macnamara ..	S. Africa		
" W. Heffernan	"		
" T. E. Noding	"		

SERVICE ABROAD.—Capts. L. F. Smith, E. W. Bliss and J. V. Forrest have been placed under orders for the West Coast of Africa, and Lieut.-Col. P. H. Johnston, C.M.G., for Jamaica.

Lieut.-Col. A. P. O'Connor, C.B., has been appointed P.M.O. of the third Division First Army Corps, vice Lieut.-Col. H. C. Kirkpatrick, transferred to Southampton.

Approval has been given for the appointment of Surgeon at the Royal Military College, Sandhurst, being converted into a post for a full pay officer, and of the charge at Topsham, Exeter, into a post for a retired officer.

The General Medical Council has consented to add the Madras, Bengal and Punjab commands to the list of those recognised as suitable for the purpose of out-door training in Hygiene under Rule 3 (e) of the Councils, Resolutions and Rules for Diplomas in Public Health.

Major J. Maher has been selected for the appointment of Surgeon at the Royal Military College, Sandhurst.

Major P. Connolly, retired, has been appointed Recruiting Medical Officer at Belfast, vice Lieut.-Col. E. A. H. Roe, who has vacated the post on reaching the age limit.

Staff-Surg. D. Hanley, retired, died April 3. He entered the Service on July 20, 1847, and was placed on half pay on July 10, 1866. He served with the 5th, 62nd and 66th Foot and the 11th Hussars. He served in the Crimean and Indian Mutiny Campaigns.

ROYAL ARMY MEDICAL CORPS.

CASUALTIES which have occurred during the month ending July 10, 1904:—

Discharges.—4895 Sergt.-Major A. King, under para. 1805 (xxiii.), K.R.; 7413 Quarter-Master-Sergt. C. A. Mines, medically unfit; 16201 Pte. R. S. J. Palmer, medically unfit; 15719 Pte. W. Stanley, medically unfit; 16346 Pte. G. Furlong, medically unfit.

Transferred to Army Reserve.—14820 Pte. W. Burton, 14807 Pte. P. Draper, 14866 Pte. A. J. Hall, 14741 Pte. R. H. Mills, 14860 Pte. E. G. Pocock, 14878 Pte. T. Alexander, 14790 Pte. G. Burns, 14845 Pte. H. W. Dormer, 14798 Pte. C. E. Mason, 14944 Pte. H. W. Woodhouse, 14422 Pte. S. Lane, 15941 Pte. J. Bigwood, 14995 Pte. T. Burman, 14095 Pte. E. R. L. Colquhoun, 11487 Pte. C. Shaw, 14904 Pte. G. W. Bouser, 14935 Pte. F. G. Gosling, 14870 Pte. W. Matthews, 14941 Pte. W. Moore, 14805 Pte. E. Rowbotham, 14889 Pte. W. C. Berry, 14813 Pte. S. Breach, 14877 Pte. R. Howard, 14846 Pte. W. Shields, 15770 Pte. T. Reeve, 11508 Pte. G. Jefferies, 14387 Pte. F. Willis, 14997 Pte. S. Lowther, 15047 Pte. W. R. Elliffe, 12444 Pte. A. Chambers.

Deaths.—6843 Sergt.-Major G. M. Burr, Kingston-on-Thames, July 8, 1904; 12645 Pte. S. Bland, Mauritius, May 15, 1904; 7494 Pte. J. Martin, Aldershot, June 30, 1904.

Transfers to other Corps.—10199 Staff-Sergt. W. H. Timbrell, to Transvaal Volunteers; 11304 Corpl. W. F. Davies, to Transvaal Volunteers; 18755 Pte. H. Walton, to 1st Royal Welsh Fusiliers; 18159 Pte. W. H. Shannon, to 2nd Royal Dublin Fusiliers.

Disembarkations from Abroad.—From South Africa, per s.s. "Plassy," June 9, 1904.—9731 Lance-Sergt. G. A. Folkes, 14935 Pte. F. C. Gosling, 14877 Pte. R. Howard, 14846 Pte. W. Shields, 14845 Pte. H. W. Dormer, 14878 Pte. T. Alexander, 14889 Pte. W. C. Berry, 14866 Pte. A. J. Hall, 14820 Pte. W. Burton, 14870 Pte. W. Matthews, 14941 Pte. W. Moore, 15561 Sergt. R. Wilkinson, invalided.

Per s.s. "Sicilia," June 28, 1904.—5812 Quarter-Master-Sergt. W. M. Muddell, 11507 Sergt. D. C. Baxter, 9890 Sergt. C. Perry, 14995 Pte. T. Burman, 14095 Pte. E. R. L. Colquhoun, 15047 Pte. W. R. Elliffe, 14968 Pte. J. Grimsdall, 14997 Pte. S. Lowther, 11743 Pte. G. Midgley, 14818 Pte. C. Sansom, 14849 Pte. J. C. Schlatter, 14837 Pte. J. Wignall.

From Sierra Leone, per s.s. "Bornu," June 26, 1904.—11170 Pte. W. Jordan, 14404 Pte. W. Phythian.

From Bermuda, per s.s. "Bavarian," June 25, 1904.—10388 2nd Class Staff-Sergt. G. J. Darke, 9502 Sergt. A. Fletcher, 9829 Corpl. H. Pollard, 13085 Pte. G. V. Chandler, 12752 Pte. A. Jackson, 11487 Pte. C. Shaw, 11602 Pte. A. Shutts.

From Malta, per s.s. "Menes," June 18, 1904.—13664 Lce.-Corpl. J. C. Dunn, 16447 Pte. J. W. Ashworth, 16563 Pte. A. Kent.

QUEEN ALEXANDRA'S IMPERIAL MILITARY NURSING SERVICE:—

Appointments: To be Staff Nurses: Miss L. M. Toller, posted to Portsmouth; Miss L. F. A. Waller, posted to Connaught Hospital, Aldershot.

Resignations: Miss S. E. Webb, R.R.C., Matron, has resigned her appointment, June 7, 1904, upon her marriage.

Changes of Station:—

Matrons: Miss H. W. Reid, Aldershot to Wynberg, South Africa; Miss E. A. Wilkinson, Woolwich to Bloemfontein, South Africa.

Sisters: Miss C. Anderson, Cape Town to Pretoria; Miss M. E. Harper, Shorncliffe to Harrismith; Miss M. Wright, Cork to Bloemfontein; Miss E. H. Hordley, Wynberg to Pretoria, as Secretary to the Principal Matron.

Staff-Nurses: Staff-Nurse Miss K. M. Hewetson from Royal Military College, Sandhurst, to Alton, for temporary duty.

Appointments Confirmed:—

Sisters: Miss F. M. Hodgins, Miss E. H. Hordley.
 Staff-Nurses: Miss K. M. Hewetson, Miss A. E. Fitzgerald, Miss S. K. Bills, Miss B. N. Daker.

THE ANNUAL DINNER of Queen Alexandra's Imperial Military Nursing Service was held at St. Andrew's Club, Mortimer Street, on Wednesday, June 29.

The Viscountess Downe presided, and the following Guests and Members of the old Army Nursing Service and Queen Alexandra's Imperial Military Nursing Service were present:—

Miss Monk, Matron, King's College Hospital; Miss Cave, Matron, Westminster Hospital; Miss Sidney Browne, Matron-in-Chief, Q.A.I.M.N.S.; Miss Gray, A.N.S.; Mrs. Eccles, A.N.S.; Mrs. Freyer, A.N.S.; Miss MacVicar, A.N.S.; Miss Briggs, A.N.S.; Miss Grist, A.N.S.; Miss Pocock, A.N.S.; Miss Dowse, A.N.S.; Miss Saunder, A.N.S.; Miss Addams-Williams, Q.A.I.M.N.S.; Miss Oram, Q.A.I.M.N.S.; Miss Garriock, Q.A.I.M.N.S.; Miss Knox, Q.A.I.M.N.S.; Miss A. B. Smith, Q.A.I.M.N.S.; Miss G. E. Saunder, Q.A.I.M.N.S.; Miss McCarthy, Q.A.I.M.N.S.; Miss Becher, Q.A.I.M.N.S.; Miss Jones, Q.A.I.M.N.S.; Miss Richards, Q.A.I.M.N.S.; Miss Tait, Q.A.I.M.N.S.; Miss Magill, Q.A.I.M.N.S.; Miss Powell, Q.A.I.M.N.S.; Miss W. Potter, Q.A.I.M.N.S.; Miss Wohlmann, Q.A.I.M.N.S.; Miss Taylor, Q.A.I.M.N.S.; Miss Hewetson, Q.A.I.M.N.S.; Miss Kendall, Q.A.I.M.N.S.; Miss Watson, Q.A.I.M.N.S.; Miss Stronach, Q.A.I.M.N.S.; Miss Byers, Q.A.I.M.N.S.; Miss Mason, Q.A.I.M.N.S.; Miss Ward, Q.A.I.M.N.S.

The health of the King, and the President of the Service, Queen Alexandra, was proposed by Lady Downe, and drunk with enthusiasm.

Great regret was expressed at the absence of the Countess Roberts, the Vice-President, who was unable, on account of a previous engagement, to attend.

Lady Downe, in an admirable speech, placed before the members the importance of the work in which Queen Alexandra's Imperial Military Nursing Service was engaged, and exhorted the Service to maintain a high standard of excellence.

Miss Monk, Matron of King's College Hospital, proposed the health of Miss Sidney Browne, the Matron-in-Chief; she expressed the satisfaction which the Civil Nursing Profession felt in the development of nursing in the Army, and cordially congratulated the members of the Service on the steady progress which had been made.

Miss Browne returned thanks in a few suitable words.

After dinner, by the kindness of Miss E. Debenham, the club rooms were used by the guests, Miss Debenham and her sister also kindly contributing to the pleasure of the guests by playing some beautiful selections on the violin, her sister accompanying her on the piano. Mrs. Freyer and Miss Saunder also sang some delightful songs.

It was the universal opinion that an Annual Dinner was an admirable institution, affording an opportunity for many old friends to meet, and that it should become as well supported in the future as it is at present.

NOTES FROM QUETTA.—Lieut. N. D. Walker, R.A.M.C., writes: "The following have lately joined the station:—

"Lieut.-Col. Lees Hall, in command of the Station Hospital.

"Lieut.-Col. J. J. C. Donnet.

"Lieut. N. D. Walker.

"Capt. Dobbin has gone home on six months' leave, and Capt. P. S. O'Reilly has taken over the duties of Staff-Surg.

"The R.A.M.C. were 'At Home' the last day of the spring races.

"The weather is warming up, and very shortly the summer camp at Ziarat will be opened."

NOTES FROM MABANTA, SIERRA LEONE PROTECTORATE.—Lieut. J. W. S. Seccombe, R.A.M.C., writes: "This West African bush station is distant about seventy miles up country from Freetown, Sierra Leone. From Freetown one goes by steam launch up river to Port Lokkoh, about forty-six miles, from there one hammocks. Hammocking is the usual method of progression in this part of the coast, where horses do not thrive; with good hammock boys it is not at all an uncomfortable way of getting about. It was decided to maintain a permanent camp at this place some four or five years ago, after the Karene expedition. A company of the West African Regiment is stationed here, with two white officers, an R.A.M.C. Officer and a white Colour Sergeant."

"The barracks at one time were constructed in native fashion of mud and thatch; they are now, however, being replaced by iron-roofed buildings. The

hospital is a small non-dieted one, it is rare to have many of the beds occupied, however, as there is little sickness amongst the soldiers. Indeed, this place is by no means the unhealthy, fever-stricken spot that many people would picture it. Black-water is almost unknown. There is not much fever; what there is is of a mild variety, usually quotidian in type and easily controlled by quinine. It is not, as a rule, due to infection hereabouts, I think, but due more often to carelessness in not using mosquito nets when sleeping in native houses on the march, or when out shooting. There are not many mosquitoes here, though *Anopheles* can be found in a swamp a little distance away.

"The Camp is situated on rising ground, not too near the river or the native village.

"There is a magnificent river here, the Mabile. Punting in a native canoe to the rapids in the dry season we had very good sport with the pigeons, which every evening used to come to the trees and rocks by the river. Now that the rains have settled in, they have forsaken the river for the rice fields, where, in conjunction with the wary bush-fowl (francolin) they seek busily for the stray grains of rice left by the natives when sowing.

"Bush-fowl are at present rather unapproachable. One cannot get at them in the bush, and in the burnt cassada fields the rice has not yet sprung up, so that there is little cover. Water-buck and harness antelope can be shot within three hours' march, also a small deer called by the natives 'fratambo.' Hippo. can be seen within four hours', but shooting them and recovering them after are two very different things. For elephant one has to go two or three days' march to the East, and are well worth trying for if one can get leave at the proper time of the year. Alligator are seen in the Mabile River from time to time. A man was pulled under last year and killed.

"At Batkanu, nineteen miles east, the headquarters of the District Commissioner, there are plenty of buck, and in addition, bustard and guinea fowl may be shot; so that although this part of the world will not compare with East Africa in the matter of game, there is yet much more than is generally believed. There are some magnificent butterflies and moths to be caught if one is interested in them, particularly just at the beginning of the rains, in April and May, that is to say. The heat here is not trying, as a rule, if one clothes rationally and avoids walking in the middle of the day. With regard to food, tinned material and potatoes can be obtained from Freetown, where there are several good stores; chicken, eggs, rice, bread and fruit are obtainable locally. The main attractions of this station are of course the pay and allowances, and the long leave. With regard to the climate, by adopting ordinary common-sense precautions, it is not difficult, as a rule, to keep fit, though some may differ with me on this point."

NOTES FROM BERMUDA.—Colonel E. H. Fenn, C.I.E., R.A.M.C., writes: "On the morning of June 4, 1904, a parade of the Detachment R.A.M.C. was held at Prospect, Bermuda, for the presentation of a medal for Long Service and Good Conduct to Sergt.-Major Davidson, R.A.M.C., by His Excellency the Governor and Commander-in-Chief, Lieut.-Gen. Sir Robert Stewart, K.C.B.

"Addressing Sergt.-Major Davidson, His Excellency said it gave him great pleasure to present the medal which had been granted by His Majesty as a reward for long service and good conduct; he was glad that Sergt.-Major Davidson would wear it beside another medal granted by the late Queen in acknowledgment of his services on the field of battle. He trusted that these medals would always be worn proudly, during a long life, and that afterwards they would be handed down to his family as an heirloom and remembrance of a life honorably spent in the service of his King and country. He hoped that those present would do their duty in such a manner that eventually they, too, would receive this high mark of His Majesty's approval.

"Sergt.-Major Davidson was present at the actions of Belmont, Enslin, Modder River and Magersfontein."

NOTES FROM DUBLIN.—Capt. T. McDermott, R.A.M.C., writes:—

Departures.—Col. G. A. Hughes, D.S.O., left for Edinburgh on June 14; Lieut.-Col. G. F. A. Smythe, June 21, 1904, to 9th Division (Mullingar).

Arrivals.—Lieut.-Col. C. R. Woods, May 28, 1904, to assume charge of Royal Infirmary; Lieut. T. J. Wright, June 18, 1904, for duty at Royal Infirmary; Civil-Surg. T. Neil, June 21, 1904, for duty at Royal Infirmary; Civil-Surg. C. R. Brown, June 6, 1904, for duty at Arbour Hill.

Appointment.—Capt. D. J. Collins, R.A.M.C., has been appointed Registrar, Royal Infirmary.

Leave.—Major M. P. C. Holt, D.S.O., July 2 to 30, with permission to travel in France and Switzerland.

Education.—17619 Pte. J. McDonald, Certificate of Shorthand of 120 words per minute.

Cooking.—6648 Quarter-Master-Sergt. R. Hughes, ordered for a course of cooking at the National School of Cooking, London.

Post-Graduate Course, Trinity College, Dublin.—The following officers are attending : Major R. I. Power, J. F. Donegan, and A. Kennedy.

BIRTHS.

CARLYON.—On May 31, at Pretoria, the wife of Capt. A. F. Carlyon, R.A.M.C., of a daughter.

DEATHS.

SELLEX.—Quarter-Master and Honorary Lieut. G. A. Sellex, died at Bulford Camp on June 18. He served in the South African War, 1879, Zulu Campaign, medal with clasp; the Egyptian Expedition, 1882, Medal, bronze star; the South African War, 1899-1902; Relief of Ladysmith, including action at Colenso; operations of January 17 to 24, 1900, and action at Spion Kop; operations of February 5 to 7, 1900, and action at Vaal Kranz; operations on Tugela Heights, February 14 to 27, 1900, and action at Pieters Hill; operations in Natal, March to June 1900, including action at Laing's Nek, June 6 to 9; operations in the Transvaal, east of Pretoria, July to November 29, 1900; operations in Cape Colony, south of Orange River, 1899-1900; operations in Orange River Colony, November 30, 1900, to May 31, 1902, Queen's medal with six clasps, King's medal with two clasps. The interment took place at Portsmouth on June 22, with full military honours.

THE ROYAL ARMY MEDICAL CORPS FUND.

SECOND GENERAL MEETING.

THE Second General Meeting was held at 3 p.m. on Monday, June 13, 1904, at the Royal United Service Institution, Whitehall. The DIRECTOR-GENERAL, Sir William Taylor, K.C.B., presided.

The Director-General, in opening the proceedings, asked those present if the Report of the former General Meeting, which had been circulated to the members and also published in the Journal, were approved. To this a general assent was given.

The Director-General then proceeded: As to the general accounts of the Fund, up to the end of last year, these having been published in the Corps Journal there does not seem to be any necessity for going into them in detail, but I think a short summary of the present position of the Fund may be of interest to the Meeting.

The present position is that there are now 701 subscribers on the Active List, and 185 on the Retired List. In addition to these we have five officers of the Auxiliary Forces, who, I am pleased to think, have identified themselves with us to such an extent as to join our Fund, after having rendered distinguished services in the Field in our ranks during the late war.

It must be a matter of regret, however, to many that such a large number as 293 officers on the Active List had not, up to the 1st instant, considered our Fund worthy of their subscriptions. Not only regret but astonishment, for I believe there is no Regimental Fund which can compete with ours in the comprehensiveness of its work. It embraces memorials to distinguished members of the Corps, the Annual Dinner, and the Band. There is no Regimental Fund which, for the modest subscription of £1 per annum, carries out duties having so wide a scope; and our Committee, in addition to these duties, administers the charities of the Corps.

I should like to touch upon the work done in the past year towards carrying out each of the objects of the Fund.

Firstly, Memorials. The Committee has put up a memorial in the Library of the Cambridge Hospital at Aldershot to the late Surg.-Gen. J. B. Hamilton.

It is negotiating the creation of a V.C. Gallery, which I hope everyone will before long have an opportunity of visiting, in the Royal Army Medical College at Millbank. And last, but not least, a prize has been instituted to perpetuate the memory of the late Professor of Hygiene, Surg.-Major de Chaumont, F.R.S. I say not least, for I hold that it is in commemorating such men as these, whose lives were spent in the search for truth, which is science, that we most truly do justice to ourselves. de Chaumont's work was for the benefit of the soldier, the army, the nation; and we are the executors of his work, and we have, and shall have for ever, the duty of adding to it

by discoveries in the causation and prevention of disease, as the main function of the R.A.M.C.

Further, your Committee has drawn up an outline of the more pressing requirements in the direction of memorials to other distinguished officers, the execution of which will be carried out as time adds to our resources. I need not now enlarge on this report, which will be before you in the pages of the Journal in due course.

Secondly, the Annual Dinner Fund was able to add £79 to our General Relief Fund last year. We found that a few retired officers did not wish any portion of their subscriptions to go towards the Dinner, so their subscriptions formed part of the above balance, which was paid in to the charities of the Corps.

Lastly, the Band Fund. You will have seen from the Quarterly Accounts the financial position of this branch. You will have observed that new instruments are being provided; the want of them has been badly felt. I hope that the increase in the income in this branch of the Fund will show itself in time, increases require time to become appreciable, but I feel sure that in this branch as in the others, your band will benefit by the *esprit de corps* which has instituted and supported the R.A.M.C. Fund.

I have given you the merest sketch of these things, as I do not wish to monopolise the talking, but to leave time for discussion. Before closing I must advert to a most important field of duty which has fallen to the lot of the R.A.M.C. Fund.

You will remember that last year it was proposed to take up the subject of the Compassionate Fund (Meeting 2, Minute 7).

Apart from the money still at Aldershot ear-marked for Widows and Orphans (£744 19s. 8d. on March 31 last), we have as balance under the head of Compassionate Fund the following sums:—

Charitable Schools	..	..	..	..	..	£1,390	19	2
Widows and Orphans	..	..	..	..	..	838	4	10
General Relief	..	..	..	..	..	367	0	6
A Total of	..	..	..	..	..	£2,596	4	6

Now this is a state of affairs on which our men may well congratulate themselves, for besides the money in hand, we have instituted a Cottage Home in memory of H.H. Prince Christian Victor, a perpetual asset to the Corps. The details of expenditure have been placed before you from time to time in our Journal. But what I want to especially draw your attention to is the allocation of the Funds. While the Widows' and Orphans' and the Charitable Schools' Funds have large balances to their credit the General Relief Fund has only at present £367. A short time back this Fund had arrived at the position of a makeshift, alluded to in the Minutes of the tenth meeting of your Committee, for providing for cases of distress among our men. By great good fortune we received just at that period a sum of some £414 from the South African Field Force Canteen for the General Relief Fund, which staved off a very serious condition.

The only Fund which enables us to relieve men is the General Relief Fund. This Fund not only provides for men in want, but also for their wives and families; and it has been the wives and families chiefly who have benefited by it. We cannot, as business men, wait for windfalls; and what I want to invite you to consider this afternoon is a means of sustaining a Fund for relieving our men and their families, without prejudice to widows and orphans; for I would point out that a General Relief Fund can be applied to succour widows and orphans, while a Widows' and Orphans' Fund cannot be applied to help men, or those who are not widows and orphans.

I ask you, as men of the world, to take a broad view of your Funds, and to enable your Committee to relieve—exercising its judgment and discretion—all cases of distress. In order to do this I would suggest that the General Relief Fund is the one which calls for support. This Fund, if you will support it, will provide for all demands, and will, when the Widows' and Orphans' Fund is exhausted, take up the function of relieving that class also. Now with regard to sustaining this Fund, I would ask those with surplus cash to dispose of, whether from Regimental Institutes or their own pockets, to place that cash in the General Relief Fund.

I do not think the R.A.M.C. Fund is in a position to give much; the balance of subscriptions to the Dinner Fund forms the only source from which we can make a donation, which may perhaps be but a small balance after the Dinner Accounts for this year have been settled. But this is an unsatisfactory, because unreliable, source of income.

Now with this statement I will leave the matter for discussion, and I have no doubt that before the meeting disperses we shall be able to congratulate ourselves on

having placed the R.A.M.C. Compassionate Fund on a satisfactory and workable basis, by providing a regular income for the General Relief Fund, which will support also Widows and Orphans when the large special Funds devoted to the latter class have been expended.

Lieut.-Col. Twiss, in taking up the question of sustaining the General Relief Fund, thought that this might be done by a grant from the different canteens. On the subject of placing children at school, he drew the attention of officers to the fact that, if such of them who are subscribers to schools would so arrange their votes as to place them all to the credit of children of the R.A.M.C., instead of, as was so often done, distributing them among the whole list of candidates, they would be more likely to benefit the class in whom they were most interested.

A discussion then followed on the question of obtaining grants from the canteens, in which Lieut.-Col. Twiss, Lieut.-Col. Wilson, Lieut.-Col. Beattie, Col. Ellis, Col. Johnston, Major Braddell, Sir Thomas Gallwey, Major Thompson and Surg.-Genl. Cuffe, took part, as the outcome of which it was resolved that the various canteens should be approached with a view to their making an annual donation to the General Relief Branch of the R.A.M.C. Fund. It was also resolved that the Committee of the Fund should take into consideration the advisability of making some appeal to the warrant officers, non-commissioned officers and men of the Corps, with a view to obtaining their support, if it should be found necessary, to the General Relief Fund, it being, however, felt that donations from the Canteen Funds may prove sufficient to meet the case.

The Chairman then drew attention to the subject of the Colours worn by the Corps. In his experience these Colours are not generally approved by the officers, and he asked for an expression of opinion from the meeting on the subject.

Sir Thomas Gallwey proposed that the Colours should be changed, and that a Committee should consider what Colours we should wear.

Major Thompson proposed as an amendment that the Colours should not be changed; the Colours, as he pointed out, were historical, as they commemorated the Royal Army Medical Corps and Army Medical Staff combined. He saw no objection to the Colours in themselves. His amendment, seconded by Major Fletcher, was put to the meeting and negatived.

Surg.-Gen. Sir Thomas Gallwey's proposal was then put to the meeting and carried. The following Committee was then elected for the purpose of considering what Colours the R.A.M.C. should adopt, and to report thereon at the next General Meeting: Col. A. T. Sloggett, C.M.G. (Chairman), H. F. Hensman, C.M.G., H. E. R. James; Lieut.-Col. A. B. Cottell; Majors H. N. Thompson, D.S.O., M. O'D. Braddell; Capt. G. B. Carter.

The Chairman having made some observations on the neglected condition of the Benevolent Fund, Col. Trevor proposed that the R.A.M.C. Fund Committee should consider the possibility of coming to the assistance of the Benevolent Fund, and should report thereon at the next General Meeting of the Fund, and also on the possibility of its being amalgamated with the R.A.M.C. Fund. Lieut. Col. Babbie, V.C., seconded this proposal.

Surg.-Gen. Cuffe pointed out, as one of the auditors of the Benevolent Fund, that that Fund was not in a position to deal with all the cases of distress which were brought before it, and it was possible that the R.A.M.C. Fund might be able to do something to put new life into the Benevolent Fund. Col. Trevor's proposal was carried unanimously.

The Director-General then thanked the officers present for having attended the meeting, thereby showing their interest in the Corps to which we belong, and whose greatest success we are all working for.

On the proposal of Surg.-Gen. Sir Thomas Gallwey, a vote of thanks was unanimously passed to the Chairman, and the meeting then terminated.

B. SKINNER.

Lieut.-Col., Hon. Sec.

June 14, 1904.

COMPASSIONATE FUND.

The following Officers have promised subscriptions to the Compassionate Fund from January 1, 1904, 5s. per annum:—

Lieut. and Quarter-Master W. J. Diggins, Lieut. and Quarter-Master J. B. Conolly.

The following have promised to subscribe from January 1, 1905, 5s. per annum:—

Capt. N. Marder; Lieut. D. P. Watson, M.B.; Lieut. S. L. Pallant; Lieut. M. C. Wetherell, M.B.; Lieut. R. T. Collins; Lieut. A. C. Osburn; Lieut. and Quarter-Master W. Duncan; Lieut. and Quarter-Master H. J. F. Audus.

Collected by the Misses A. and T. Gordon for the R.A.M.C. Cottage Home, and now transferred to the R.A.M.C. Fund for General Relief :—

"Balance of War Fund collected by Mrs. H. L. Battersby for the R.A.M.C."	£	s.	d.
Lieut.-Col. Alfred C. Clarke, R.A.M.C.	5	0	0
The Rev. A. C. and Mrs. Crick	0	10	6
Collected in small sums	2	0	0
	2	6	6
	<hr/>		
	9	17	0
To make even money	0	3	0
	<hr/>		
	£10	0	0

68, Victoria Street, S.W.
July 16, 1904.

B. SKINNER, Lieut.-Col.,
Hon. Secretary.

PARKES' MEMORIAL PRIZE.

The triennial award of this prize, consisting of seventy-five guineas and a bronze medal, has been made to Major R. Caldwell, R.A.M.C., for the best essay sent in upon "The Prevention of Disease amongst Armies engaged in Active Operations in the Field, with special reference to the sanitary organisation of a Field Force." The essays submitted by Majors E. C. Freeman and F. Smith, D.S.O., of the Royal Army Medical Corps, were highly commended by the assessors. The subject of the next prize is "On the Sanitary Requirements of Naval and Military Units in Peace and War; with suggestions for complete schemes of sanitary organisation suitable for both the Navy and the Army." The competition is open to officers of the Naval, Army and Indian Medical Services. Essays should be submitted to the Secretary of the Parkes' Memorial Fund, Royal Army Medical College, Examination Hall, Victoria Embankment, London, W.C., on or before December 31, 1906.

HOSPITAL FOR OFFICERS.

HONORARY MEDICAL STAFF.

The following is a list of the Honorary Medical Staff for King Edward the Seventh's Hospital for Officers.

Sir Thomas Smith, Bart., K.C.V.O., F.R.C.S.
Sir Frederick Treves, Bart., K.C.V.O., C.B., F.R.C.S., LL.D.
Dr. Charles A. Morris, C.V.O., F.R.C.S.
Mr. Herbert W. Allingham, F.R.C.S.
Sir Thomas Barlow, Bart., K.C.V.O., M.D., F.R.C.P., M.R.C.S., LL.D.
Sir William Henry Bennett, K.C.V.O., F.R.C.S., L.R.C.P.
Mr. Tom Bird, M.R.C.S.
Mr. Anthony A. Bowlby, C.M.G., F.R.C.S.
Sir William H. Broadbent, Bart., K.C.V.O., M.D., F.R.C.P., F.R.S., LL.D.
Mr. Arthur H. Cheate, F.R.C.S., L.R.C.P.
Mr. G. Lenthal Cheate, C.B., F.R.C.S.
Sir Anderson Critchett, F.R.C.S. Edin., M.R.C.S. Eng.
Dr. Alexander Crombie, C.B., L.R.C.S. Edin.
Dr. David Ferrier, F.R.C.P., F.R.S., LL.D.
Dr. P. Johnston Froyer.
Sir Alfred Downing Fripp, C.V.O., C.B., F.R.C.S., L.R.C.P.
Mr. Rickman Godlee, M.S., F.R.C.S.
Dr. James Frederick Goodhart, F.R.C.P., M.R.C.S., LL.D.
Dr. Frederick William Hewitt, M.V.O., M.R.C.S.
Sir Victor A. H. Horsley, F.R.C.S., F.R.S.
Mr. George Henry Makins, C.B., L.R.C.P., F.R.C.S.
Mr. John Percy Mummery, F.R.C.S., M.R.C.S., L.R.C.P.
Dr. Frederick W. Pavy, F.R.C.P., F.R.S., LL.D.
Sir Richard D. Powell, Bart., K.C.V.O., F.R.C.P., M.D., M.R.C.S.
Dr. William Andrew Turner, F.R.C.P.
Mr. Henry Roe Walker, M.R.C.S., L.R.C.P.
Dr. William Hale White, F.R.C.P., M.R.C.S.

JOURNAL

OF THE

ROYAL ARMY MEDICAL CORPS.

Corps News.

SEPTEMBER, 1904.

ROYAL ARMY MEDICAL CORPS.

The undermentioned Lieuts. to be Capts., dated June 27, 1904 :—

F. W. Lambelle, M.B. ; M. C. Beatty, M.B. ; T. F. Ritchie, M.B. ; A. W. Lampey ; T. J. Potter ; A. J. Williamson, M.B. ; E. V. Aylen ; H. R. Rogers, M.B. ; W. Davis ; D. J. F. O'Donoghue.

The undermentioned Lieuts. are confirmed in that rank :—

R. M. Ranking ; F. J. Turner ; G. F. Rugg ; D. S. B. Thomson, M.B. ; J. Fairbairn, M.B. ; L. Bousfield, M.B. ; J. H. Douglass, M.D. ; A. S. Arthur, M.B. ; R. R. Lewis ; A. L. Otway, M.B. ; C. H. Turner ; D. Le Bas ; E. C. Whitehead, M.B. ; W. F. H. Vaughan ; R. B. Hole, M.B. ; T. C. Lucas ; G. E. Cathcart ; W. Wiley, M.D. ; H. Howard, M.B. ; J. A. Turnbull ; M. F. Grant ; D. P. Johnstone ; E. H. M. Moore ; M. D. Aherne ; F. J. Garland, M.B. ; A. A. Meaden ; R. J. Cahill, M.B. ; H. B. Connell.

Lieut.-Col. G. T. Trewman, M.B., half-pay, retires on retired pay, dated August 3, 1904.

Major R. H. Clement retires on retired pay, dated August 3, 1904.

Major G. B. Russell, M.B., retires on retired pay, dated August 3, 1904.

Major L. R. Colledge, F.R.C.S. Edin., retires on retired pay, dated August 3, 1904.

Major S. Butterworth retires on retired pay, dated August 3, 1904.

Capt. H. H. Norman is placed on temporary half-pay on account of ill-health, dated July 25, 1904.

The undermentioned Capts. to be Majors, dated July 27, 1904 :—

H. A. Hinge ; J. G. McNaught, M.D. ; H. A. Bray ; T. McDermott, M.B. ; E. W. Slayter, M.B. ; H. S. Thurston ; L. P. More, M.D. ; C. O'C. Hodgins ; Brevet-Major A. F. Tyrrell ; T. P. Jones, M.B. ; W. D. Erskine, M.B. ; A. G. Thompson, M.B. ; G. A. Moore, M.D. ; R. C. Lewis ; R. F. E. Austin ; H. W. H. O'Reilly, M.B. ; N. Marder ; E. H. Condon, M.B. ; G. S. Mansfield, M.B. ; F. G. Faichnie ; H. W. K. Read ; A. J. Chambers.

Dated July 30, 1904 : F. M. Mangin ; C. E. Pollock ; W. J. Taylor, M.B. ; B. W. Longhurst ; J. H. Rivers.

Lieut. W. B. Taylor resigns his Commission, dated August 10, 1904.

Col. R. Blood, M.D., retires on retired pay, dated August 13, 1904. He entered the Service on September 30, 1871 ; was promoted Surg.-Major, September 30, 1883 ; Lieut.-Col., September 30, 1891 ; and Col., August 10, 1901.

Lieut. S. C. Bowle, from the Seconded List, to be Lieut., dated August 1, 1904.

ARMY MEDICAL RESERVE OF OFFICERS.

Surg.-Lieut. S. M. Sloan to be Surg.-Capt., dated July 6, 1904.

Capt. H. E. Dalby, Royal Army Medical Corps Militia, to be Surg.-Capt., dated July 20, 1904.

Surg.-Lieut. R. C. Gayer, Surrey Imperial Yeomanry, to be Surg.-Lieut., dated July 20, 1904.

Surg.-Lieut. J. T. K. Thomson to be Surg.-Capt., dated July 13, 1904.

Surg.-Capt. C. E. L. B. Hudson, F.R.C.S. Eng., to be Surg.-Major, dated July 16, 1904.

Surg.-Lieut. H. Stallard, 4th Volunteer Battalion The Sherwood Foresters (Nottinghamshire and Derbyshire Regiment), to be Surg.-Lieut., dated July 27, 1904.

Surg.-Capt. W. A. Atkinson, M.D., to be Surg.-Major, dated July 23, 1904.

Surg.-Lieut. J. R. Williams to be Surg.-Capt., dated July 20, 1904.

Capt. A. R. Badger, Worcester and Warwick Bearer Company, Royal Army Medical Corps (Volunteers), to be Surg.-Capt., dated August 3, 1904.

Surg.-Lieut.-Col. J. G. Saville, having resigned his Volunteer appointment, ceases to belong to the Army Medical Reserve of Officers.

Surg.-Major A. D. Fraser, M.B., to be Surg.-Lieut.-Col., dated August 2, 1904.

ROYAL ARMY MEDICAL CORPS (VOLUNTEERS).

Welsh Bearer Company.—Brig.-Surg.-Lieut.-Col. C. Downing is seconded, whilst holding the appointment of Senior Medical Officer to the Welsh Volunteer Infantry Brigade, dated August 6, 1904.

1st Midlothian Royal Garrison Artillery Volunteers.—Duncan Robert Macdonald, Gent., to be Surg.-Lieut., dated July 16, 1904.

1st London Royal Engineers Volunteers.—Surg.-Lieut. J. C. Jackson resigned his Commission, dated July 16, 1904.

1st Volunteer Battalion the Hampshire Regiment.—Surg.-Lieut. J. A. James to be Surg.-Capt., dated July 16, 1904.

1st Volunteer Battalion the Durham Light Infantry.—Surg.-Lieut.-Col. J. W. Blandford to be Brig.-Surg.-Lieut.-Col. whilst holding the appointment of Senior Medical Officer of the Durham Light Infantry Volunteer Infantry Brigade, dated July 16, 1904.

Surg.-Capt. L. J. Blandford, M.B., is borne as supernumerary whilst commanding the Durham Light Infantry Volunteer Infantry Brigade Bearer Company, dated July 16, 1904.

1st Cornwall (Duke of Cornwall's) Royal Garrison Artillery Volunteers.—Surg.-Capt. J. Ratcliff-Gaylard resigns his Commission and is appointed Capt., dated July 23, 1904.

Royal Army Medical Corps (Volunteers), the Woolwich Companies.—Maurice Waugh Renton, Gent., to be Lieut., dated July 23, 1904.

4th Volunteer Battalion the Queen's (Royal West Surrey Regiment).—Surg.-Lieut. A. M. Hickley resigns his Commission, dated July 23, 1904.

1st Cadet Battalion the Royal Fusiliers (City of London Regiment).—Surg.-Lieut. A. R. Owst to be Surg.-Capt. dated July 23, 1904.

1st Cornwall (Duke of Cornwall's).—Edwyn Gaved Andrews, Gent., to be Surg.-Lieut., dated July 30, 1904.

2nd Hampshire.—Surg.-Lieut.-Col. G. G. Sparrow resigns his Commission, and is granted the honorary rank of Surg.-Col., with permission to wear the prescribed uniform, dated July 30, 1904.

3rd Volunteer Battalion the Devonshire Regiment.—Surg.-Lieut. E. R. Tweed to be Surg.-Capt., dated May 15, 1904.

5th (The Hay Tor) Volunteer Battalion the Devonshire Regiment.—Surg.-Major E. Haydon, M.B., resigns his Commission, and is granted the honorary rank of Surg.-Lieut.-Col., with permission to wear the prescribed uniform, dated July 30, 1904.

1st Volunteer Battalion the Suffolk Regiment.—Brig.-Surg.-Lieut.-Col. G. S. Elliston is seconded whilst holding the appointment of Senior Medical Officer of the Harwich Volunteer Infantry Brigade, dated July 30, 1904.

1st (Hertfordshire) Volunteer Battalion the Bedfordshire Regiment.—Surg.-Capt. J. E. B. Wells resigns his Commission, dated July 30, 1904.

2nd Volunteer Battalion the Worcestershire Regiment.—Surg.-Lieut. H. B. Emerson resigns his Commission, dated July 30, 1904.

1st Volunteer Battalion the Duke of Cornwall's Light Infantry.—Surg.-Lieut. F. Chown, M.B., to be Surg.-Capt., dated July 30, 1904.

1st Volunteer Battalion the King's (Shropshire Light Infantry).—Surg.-Major F. K. Pigott to be Surg.-Lieut.-Col., dated July 30, 1904.

1st Herefordshire.—Surg.-Major J. W. Hinings resigns his Commission and is granted the honorary rank of Surg.-Lieut.-Col., with permission to wear the prescribed uniform, dated July 30, 1904.

1st Bedfordshire Royal Engineers.—Surg.-Lieut. G. H. Goldsmith, M.D., to be Surg.-Capt., dated August 6, 1904.

3rd (Dumfries) Volunteer Battalion the King's Own Scottish Borderers.—Surg.-Lieut. G. R. Livingston, M.B., is borne as supernumerary whilst commanding the Scottish Border Volunteer Infantry Brigade Bearer Company, dated August 6, 1904.

4th Volunteer Battalion the East Surrey Regiment.—Surg.-Capt. W. H. F. Young resigns his Commission, dated August 6, 1904.

2nd Volunteer Battalion the Hampshire Regiment.—Robert Enwraight Lauder, Gent., to be Surg.-Lieut., dated August 6, 1904.

2nd Volunteer Battalion the South Staffordshire Regiment.—Cyril Stephen Stokes Rigby, Gent., to be Surg.-Lieut., dated August 6, 1904.

4th Volunteer Battalion the King's (Liverpool Regiment).—Arthur Price, Esq., late Surg. Royal Naval Artillery Volunteers, to be Surg.-Capt., dated August 13, 1904.

5th (The Hay Tor) Volunteer Battalion the Devonshire Regiment.—Surg.-Lieut. W. J. Stephens resigns his Commission, dated August 13, 1904.

3rd Volunteer Battalion the Royal Welsh Fusiliers.—Surg.-Lieut. J. R. Williams, M.B., to be Surg.-Capt., dated August 13, 1904.

3rd Volunteer Battalion the South Wales Borderers.—Surg.-Major J. R. Essex to be Surg.-Lieut.-Col., dated August 13, 1904.

IMPERIAL YEOMANRY.

Lancashire Hussars.—John Towse Nisbet, M.D., to be extra Surg.-Lieut., under Paragraph 30, Yeomanry Regulations, dated July 23, 1904.

Oxfordshire (Queen's Own Oxfordshire Hussars).—Archibald Henry Hogarth, Gent., to be Surg.-Lieut., dated July 30, 1904.

ARRIVALS HOME.—From Somaliland: Col. J. F. Williamson, C.M.G. West Coast of Africa: Lieut. C. V. B. Stanley. South Africa: Capt. G. B. Crisp.

ARRIVALS HOME ON LEAVE.—Majors F. W. Hardy, R. H. Penton, D.S.O.; E. E. Powell, A. B. Hinde, G. H. B. Barefoot; Capts. A. R. Greenwood, W. Bennett, W. C. Croly, G. Baillie, M. G. Sterling, G. B. Crisp, T. Biggam, J. Conway; Lieut. S. M. Adye-Curran.

POSTINGS.—Major T. H. F. Clarkson to Jersey; Capt. G. B. Crisp to Netley; Capt. A. W. Sampey to Ireland; Major R. Crofts to Cork; Major J. W. Jennings, D.S.O., to Chester; Capt. J. H. Brunskill to Curragh.

CHANGES OF STATION.—Major S. F. Clark, Devonport to Dartmoor; Capt. M. M. Rattray, Dover to Salisbury Plain; Lieut. D. P. Watson, Netley to Dartmoor, Lieut. W. F. Ellis, Woolwich to Chatham; Lieut. F. C. Lambert, Woolwich to Colchester; Lieut. S. L. Pallant, Netley to Salisbury Plain.

ROYAL ARMY MEDICAL CORPS.

CASUALTIES, &c., from July 11 to August 10, inclusive.

Discharges.—5442 Quarter-Master-Sergt. E. W. Gordon, 2nd period, July 13; 5573 Quarter-Master-Sergt. C. P. Bowbyes, 2nd period, August 2; 5943 Quarter-Master-Sergt. W. Brown, medically unfit, July 27; 15204 Staff-Sergt. A. H. Carter, medically unfit, July 27; 5476 Corpl. A. Watkins, 2nd period, July 12; 16045 Corpl. L. G. Pronger, purchase, August 8; 10383 Pte. R. Forbes, 1st period, July 17; 17968 Pte. F. J. H. Anguetil, purchase, July 19.

Army Reserve.—15964 Pte. T. G. Fowler, July 15; 11602 Pte. A. Shutts, July 25.

Transfers to other Corps.—9044 Sergt. J. Brown, 2nd Life Guards, July 21; 17901 Sergt. G. P. Jones, Col. Govt., July 23; 18338 Lce.-Corpl. G. F. Richardson, Oxfordshire Light Infantry, July 20; 12001 Pte. W. Carlton, 2nd Grenadier Guards, July 15; 18016 Pte. A. Elwell, Durham Light Infantry, July 20; 19071 Pte. L. L. Tompkins, Oxfordshire Light Infantry, July 26.

Embarkations.—To Malta, July 2: 17430 Lce.-Corpl. W. H. Woods, 18264 Pte. G. H. Murray, 17563 Pte. J. Stanton, 18318 Pte. E. G. Thomas, 18253 Pte. J. Suter, 14293 Pte. W. E. Eaton, 18770 Pte. A. Fosh, 18494 Pte. J. L. Major. To North China, July 8: 9697 Sergt. C. W. France, 10073 Sergt. W. Merchant.

Disembarkations.—From Hong Kong: 9135 Staff-Sergt. E. H. Senior, 16836 Pte. F. T. Williams.

From Somaliland: 11733 Pte. J. Benson, 18202 Pte. J. W. G. Hinton, 12581 Pte. W. Ralston.

From Bermuda: 7479 Staff-Sergt. A. F. Ovens, 12139 Pte. G. Hill.

From Egypt: 16015 Staff-Sergt. H. Kirton.

From South Africa, August 8: 7342 Quarter-Master-Sergt. C. Perry, 7875 Staff-Sergt. C. Hunt, 10086 Staff-Sergt. A. W. Holding, 12668 Sergt. E. W. Sellex, 8903 Lce.-Sergt. J. Robson, 8516 Lce.-Sergt. G. S. Harrington, 10598 Corpl. P. G. Knightley, 12325 Lce.-Corpl. J. J. Jessop, 9405 Lce.-Corpl. C. Valence, 14617 Lce.-Corpl. H. Aston, 12270 Lce.-Corpl. J. Simmons, 15237 Pte. W. Clark, 15578 Pte. E. C. Hammond, 15004 Pte. A. Heron, 15005 Pte. C. A. Jenkins, 15547 Pte. H. W. Joy, 15579 Pte. G. L. Lyons, 15191 Pte. W. Mason, 14894 Pte. A. McClarnon, 15581 Pte. J. McCavert, 14988 Pte. F. Percy, 14989 Pte. H. Reid, 15061 Pte. H. Shannon, 14998 Pte. E. Sharples, 14806 Pte. A. Smith, 15546 Pte. J. T. Spencer, 14994 Pte. T. H. Wright, 16276 Pte. S. O'Prey.

Deaths.—5630 Staff-Sergt. S. G. Boughton, Ceylon, June 24; 16568 Pte. A. Kent, Woolwich, July 26.

QUEEN ALEXANDRA'S IMPERIAL MILITARY NURSING SERVICE:—

Appointments: To be Sister: Miss M. Smith, posted to Netley.

To be Staff-Nurses: Miss F. A. Dawson, posted to Caterham; Miss F. G. P. de Stourdz-Zrinyi, posted to Woolwich; Miss H. M. Drage, posted to Netley; Miss E. M. Keays, posted to Netley; Miss E. L. McAllister, posted to Netley; Miss E. M. Perkins, posted to Netley; Miss G. M. Smith, posted to Woolwich; Miss M. E. Wilkin, posted to Netley.

Resignations: Miss E. L. C. Crowe, Staff-Nurse, has resigned her appointment, August 12, 1904.

Change of Stations:—

Matrons: Miss C. M. Chadwick, R.R.C., to Harrismith, Orange River Colony; Miss E. Ferguson, to Wynberg, Cape Colony; Miss M. Russell, R.R.C., to Standerton, Transvaal; Miss M. Thomas, to Pretoria.

Sisters: Miss C. Anderson, to Barberton; Miss E. A. Cox, to Potchefstroom; Miss M. E. Harding, to Wynberg; Miss M. G. Hill, R.R.C., to Pretoria; Miss J. Hoadly, R.R.C., to Maritzburg; Miss F. M. Hodgins, to Pretoria; Miss A. C. Jacob, to Wynberg; Miss M. R. Makepeace, to Kroonstad, Orange River Colony; Miss E. J. Martin, to Standerton; Miss A. Nixon, to Middleburg, Transvaal; Miss D. F. Palmer, to Potchefstroom; Miss D. I. Rickards, to Bloemfontein; Miss A. Rose-Innes, to Middelburg, Cape Colony; Miss S. I. Snowdon, to Krugersdorp; Miss M. Steenson, to Standerton; Miss E. M. E. Todd, to Pietermaritzburg; Miss L. M. Todd, to Mooi River; Miss M. G. A. Warner, to Wynberg.

Appointments Confirmed:—

Staff-Nurses: Miss E. Barber, Miss G. Knowles.

Promotions: The undermentioned Staff-Nurses to be Sisters, dated August 9, 1904:—

Miss M. M. Bond, Miss A. F. Byers, Miss E. M. Denne, Miss M. Kendal, Miss S. B. Lanyon, Miss E. M. Pettie, Miss C. G. Stronach, Miss A. A. Wilson,

NOTES FROM MALTA.—Capt. Kennedy writes that "It has been felt that there is a lack of social intercourse between the Officers R.A.M.C., in Malta, where we, as a Corps, are much scattered and suffer from the lack of a mess of our own. With this in view we are arranging for a quarterly Corps dinner and guest night, and it is proposed to hold the inaugural dinner on June 13, the same night as the annual Corps dinner at home.

"There has also been started a monthly Corps meeting with the object of bringing all the officers of the Corps together once a month to discuss questions of social and professional interest. The last one was held on the 11th inst., when several items of interest were discussed. Major Lawson read some notes on the 'Treatment of Malta Fever by Hypodermic Injections of Strychnine.' The theory he put forward came to this, that the strychnine being absorbed and circulating in the blood as such was able to exert a direct germicidal action on the micrococci in the circulation, besides having a tonic action on the vascular system and thereby preventing the congestion of various organs, especially of the lungs. He cited two or three cases in which recovery under this treatment had been very rapid. Major Lawson also exhibited photographs of an extraordinary case of dislocation of the elbow-joint, in which the bones of the forearm were rotated in the long axis of the humerus until the normal anterior surfaces of radius and ulna were looking backwards and inwards. Several other members brought forward interesting cases.

"The members of the Hospitals Committee of the Advisory Board paid a flying visit to us last month and spent a very busy four days inspecting the various hospitals in the island.

"The following officers have proceeded home on leave: Major Clarkson; Capts. Ford, White and Bransbury."

MALTA. CRICKET. GOVERNOR'S CUP, SECOND ROUND. ROYAL ARTILLERY WESTERN DISTRICT (HOLDERS) v. R.A.M.C.—This match was concluded on the Marsa on Tuesday last, and resulted in a well-deserved win for the R.A.M.C. by 7 wickets. On the close of the second day's play the R.A. had scored 331 in their two innings, while the R.A.M.C. in their first innings had scored 166, the game thus standing at quite an even phase. However, Capt. Bostock and Pte. Fish recommenced, and before they parted company over a century stood to their credit, which put the winners in a very safe position. The necessary runs were added for a loss of 3 wickets. For the losers, Gunner Wesley, Gunner Barton, C.S.M. Walton and Trumpeter Malone batted well for their side, whilst Master Gunner Hind and Gunner Barton deserve great credit for their untiring energy with the ball. For the winners, Capt. Bostock put on 151 runs for once out, and Pte. Fish 92 runs, both giving an excellent display of sound cricket. Capt. Bostock also took 9 wickets for 93 runs, while Pte. Hawes bowled well with hard luck, taking 4 wickets for 87 runs. Considering the small number of the R.A.M.C. in Malta, such a result redounds greatly to their credit, and we wish them luck in their next (the semi-final) bout.

NO. 10 COMPANY ROYAL ARMY MEDICAL CORPS CRICKET CLUB, CHATHAM.—The following matches have been played since the above Company's club's notice in the Corps Journal for July:—

Versus Dockyard Police, Chatham.	Won by 10th Company R.A.M.C.
" Chatham Tradesmen C.C.	Lost " "
" Maidstone Companys R.A.M.C.V.	Won " "
" R.M.L.I., Chatham Division	Won " "
" Hoo St. Mary's C.C.	Won " "
" Rochester Conservative Club.	Lost " "
" Maidstone Companys R.A.M.C.V.	Won " "
" New Brompton Nondescripts.	Lost " "
" R.M.L.I., Chatham Division.	Lost " "
" Serpts. 4th Battalion Rifle Brigade.	Won " "

Summary of matches up to July 31 for 10th Company R.A.M.C., as follows:—
Played, 16; won, 11; lost, 5.

Pte. E. Nicholas, R.A.M.C., has been presented with a bat by Capt. H. A. L. Howell, R.A.M.C., for his all-round good play for the first eleven matches.

NOTES FROM ALDERSHOT.—Capt. Hinge writes: "The cricket season here has, so far, been a very successful one for the Corps. Eleven matches have been played against regimental teams in the 1st Army Corps, and one against the 5th Infantry Brigade at Borden, the latter being the only game lost. The others, with the exception of two drawn games, have resulted in wins. In the Inter-regimental Cricket Tournament of the 1st Army Corps the East Yorkshire regiment was defeated in the first round, and the Royal Engineers in the second. The third round, against the Manchester regiment, if successful, will put the Corps in the semi-finals. Mr. Turner, Mr. Lucas, and Major Scanlan (Capt.) as bats, and Mr. Lewis with the ball, have chiefly helped towards these results, though the strength of the team lies more especially in its absence of a 'tail.'

"The Band of the Corps played at the Club Gardens on several of these occasions."

NOTES FROM DEVONPORT.—*Presentation of Good Conduct Medals at Devonport.*—On behalf of Lieut.-Gen. Sir W. F. Butler, K.C.B., commanding the Western District, Col. G. D. Bourke, R.A.M.C., P.M.O., W.D., yesterday presented at the Station Hospital, Devonport, good conduct medals to Staff-Serpts. J. Varley, T. Ryan and J. G. McLean. The whole company stationed at the hospital fell in in review order and, with ambulance wagons and equipment, were inspected by Col. Bourke. The other officers present were Lieut.-Col. J. M. Jones (medical officer in charge of the hospital), Majors L. R. Colledge, S. F. Clark, F. S. Le Quesne, V.C., G. A. T. Bray, Capt. A. E. Master, Capt. and Quarter-Master D. J. Gilman, and Lieut. and Quarter-Master J. Green. In presenting the medals, Col. Bourke regretted that Lieut.-Gen. Sir William Butler was absent on leave, and could not present the medals. He (Col. Bourke) congratulated Staff-Serpts. Varley, Ryan and McLean on receiving the medals, and hoped they would live long to wear them. He also hoped that the presentation of the medals would stimulate the members of the R.A.M.C. to further efforts to perform their duties

in a satisfactory manner. It was most essential in their Corps that they should be well behaved and keen in their work. At the close of the ceremony the Principal Medical Officer and the other officers and Company were photographed.

NOTES FROM SALISBURY.—Lieut.-Col. G. Countts writes: "The Royal Army Medical Corps Camp of Instruction of the 2nd Army Corps was opened at Bulford on July 2, this being the second year during which it has been held. The complete equipment of a Field Hospital and Bearer Company was sent from Portsmouth for the purposes of the training, and the following Permanent Staff, kindly detailed for the most part by the Director-General, Army Medical Service, assembled on June 27: Commandant, Lieut.-Col. C. R. Tyrrell, R.A.M.C.; Adjutant and Assistant Instructor, Major G. Bray, R.A.M.C.; Quarter-Master, Capt. J. Hirst, R.A.M.C.; Regimental Sergt.-Major, Sergt.-Major P. Crowley; Sergt. Instructors, &c., Sergts. Nosworthy, Page and Wells; also Corpl. Burke, two Buglers, and eight Privates.

"Contingents of Officers, N.C.O.'s and men joined for instruction on July 2, from the South-Eastern, Southern and Western Districts and Netley. The following Officers, N.C.O.'s and Privates joined as above:—

"*South-Eastern District.*—Major J. P. S. Hayes; Quarter-Master and Hon.-Lieut. R. Cowan; Sergt.-Major E. Fry; Staff-Sergts. Young and Eldergill; Sergt. Miller; Corpls. Davidson and Pratt; Lce.-Corpl. Baker, and ten Privates.

"*Southern District.*—Major E. A. Burnside; Capt. J. D. G. Macpherson; Sergt.-Major G. Cronin; Quarter-Master-Sergt. F. Morton; Staff-Sergts. Healy and Southwood; Corpls. Hubbard, Lenton and Trueman, and fifteen Privates.

"*Western District.*—Major H. W. Adamson; Lce.-Sergt. Cross; Corpl. Martin; Lce.-Corpl. Jones, and fifteen Privates.

"*Netley.*—Major J. Kearney; Lieut. D. P. Watson; Lieut. S. L. Pallant; Quarter-Master-Sergt. Kenshole; Sergts. C. Warner, A. Miller and H. McCreeth; Corpls. Whale and Lunney; one Bugler, and twenty Privates. This formed a class of eight Officers, two Warrant Officers, and eighty-two N.C.O.'s and men. Horses for transport purposes and for mounting Officers other than Field Officers were provided by a Transport Company of the Army Service Corps attached to the R.A.M.C. Camp for the training. The class was inspected by the P.M.O., 2nd Army Corps, on July 14. The exercises, which were confined to stretcher and wagon drill (owing to the men having had a long morning at field hospital and bearer company work), were gone through smartly.

"The condition of the camp reflected the greatest credit on all concerned, the institutes, &c., being in excellent condition. The cooking was very good, and the comfort of the messes (Officers' and Sergeants') and canteen and coffee shop, all furnished by Lipton's, was everything that could be desired.

"The first class was dismissed on July 15, and the following Officers, N.C.O.'s and men joined on the 16th for a similar course of fourteen days:—

"*South-Eastern District.*—Major H. E. Cree; Quarter-Master and Hon. Lieut. H. G. Hassell; Staff-Sergt. O'Hara; Sergt. Barlow; Lce.-Sergt. Haines; Corpl. Chambers; Lce.-Corpl. Howard, and thirteen Privates.

"*Southern District.*—Major J. E. Brogden; Staff-Sergts. Mellon and Self; Sergt. Stevenson; Lce.-Sergt. Bell; Corpls. Freeman, Simmonds and Dainty, and seventeen Privates.

"*Western District.*—Major A. L. Borradaile; Major H. E. Winter; Sergt.-Major Fowler; Corpl. Crowther; Lce.-Corpl. Young, and fifteen Privates.

"*Netley.*—Capt. D. Lawson; Lieut. A. C. Osburn; Lieut. R. T. Collins; Sergts. Malyon and Reeve; Lce.-Sergt. Singleton; Corpls. Simms, Stanley and Boughtwood; Bugler Prince, and twenty Privates. The field exercises are proving of great advantage to Officers and men, who are entering into them with great spirit, but it is generally regretted that the instructions for the training of a combined field hospital and bearer company have not been sufficiently matured to enable them to be practised this year at Bulford."

NOTES FROM DUBLIN.—Capt. T. McDermott, R.A.M.C., writes:—

"*Field Ambulance Training.*—Lieut.-Col. R. H. Sawyer; Capt. F. G. Fitzgerald, 1 Warrant Officer, 3 N.C.O.'s, and 30 Privates left for Curragh on July 25, for field training.

"*Militia.*—Capt. J. Clerke; Lieut. C. R. Tichborne, and Lieut. and Quarter-Master F. Bruce, with 57 N.C.O.'s and men, Dublin District Company, R.A.M.C. (Militia), assembled for their annual training at Dublin on the 18th inst., and then proceeded to the Curragh. Capt. Clerke is in command of this Company as well as the Curragh District Company (M).

"Arrival.—Nursing Sister M. L. Potter, July 11, 1904.

"Departures.—Nursing Sisters French and Flanagan."

NOTES FROM CHUMBI, THIBET.—After ten days of arduous marching in a constant downpour of rain, A/22 British Field Hospital, under Capt. T. H. Stevenson, R.A.M.C., arrived at Chumbi from Siliguri, the railway base, on June 26. The transport difficulties are enormous at present, there being no cart-road beyond Rungpo, thirty-two miles from Darjeeling. After that point there is a never-ending succession of various modes of transport. On no two days is it the same, and more often than not all the loads have to be changed from mules to coolies or from coolies to pack-bullocks during one march.

Coming over the passes Sebu La, 14,500 feet, and Nathu La, 14,000 feet, many of the doolie bearers and hospital establishment were completely knocked up with nausea, vomiting and splitting headache. Apart from the natural helplessness of the doolie bearers recruited in the plains of India at such altitudes, it would be quite impossible to carry sick or wounded over these passes in the regulation hospital doolie. Even the hill-men could not carry the empty doolies over, so they had to be taken to pieces and made into light loads.

Here at Chumbi a small wooden hospital, to hold sixteen to eighteen beds, has been put up for British troops, and we found half the beds occupied when we arrived. What was our surprise to find a nursing sister as well! Miss Annie Taylor, the intrepid Missionary from Yatung, who has spent nine years here amongst the Thibetans, and is the heroine of an adventurous journey from the Chinese frontier to within three days' march from Lhasa, accompanied only by her two faithful servants, has offered her services as nurse to the British troops, and has been installed in the Chumbi Field Hospital and given a little wooden hut to live in. So we have the only European lady in Thibet as our nursing sister in A/22.

There are now four R.A.M.C. Officers in Thibet: Major Aldridge, R.A.M.C., is here in Chumbi, acting as S.M.O., Lines of Communication; Capt. Mainprise, R.A.M.C., is in command of Section D/21, British Field Hospital, with the advance column at Gyantse; Capt. Connolly, R.A.M.C., is attached to the Royal Fusiliers, also with the advance; and A/22, British Field Hospital, stationed at Chumbi, is in charge of Capt. Stevenson, R.A.M.C.

There is also a section of a Native Field Hospital here, under Lieut. O'Leary, I.M.S., and another section, under Capt. Lloyd, I.M.S., arrives to-morrow.

Chumbi is over 9,000 feet above the sea-level, and has an excellent climate. The rainfall, compared with that of Sikkim, across the passes, is slight. Cholera is unknown, and there is very little sickness. Men coming up from India suffer from a form of hill diarrhoea, and a large percentage of the cases coming from the front suffer from this complaint. Wounds heal very rapidly, and give little trouble.

There is no doubt that the Chinese are the real rulers of the country, and that the Thibetans are absolutely under their power. Even here a special pony dak is sent daily from the frontier barrier by a roundabout route, avoiding the mission camp to Lhasa, giving every piece of available information regarding movements of troops, &c., to the Chinese authorities at Lhasa. The entire trade of the country is in the hands of the Chinese, and they will not give it up without a struggle.

NOTES FROM PESHAWAR.—The cold weather being a thing of the past, and the Peshawar season being over, the following notes of events which occurred during the past year are forwarded:—

The Peshawar District was converted from a second to a first-class district, thus creating an appointment for an additional Colonel on the Indian Establishment. Col. G. D. Bourke, R.A.M.C., was the first P.M.O. appointed to the new district, and on his being transferred, tour expired, to England, he was succeeded by Col. W. L. Chester, R.A.M.C. In addition to the stations formerly in the district, the following have been added: Attock, Abbottabad, Mardan, Dargai, Malakand, Chakdara, and Chitral.

A Peshawar Medical Society was inaugurated by Col. Bourke, who was the first President. This Society, though very young, is promising well, and is to be congratulated on possessing an able and energetic Secretary in Dr. Lankester, Missionary Medical Officer.

Lieut.-Col. M. W. Kirm succeeded Lieut.-Col. P. Mulvaney in command of the Station Hospital. Capt. W. E. Hudleston, an old resident and popular member of Peshawar society, proceeded, tour expired, to England, and was succeeded by Capt. J. Poe in the staff surgeoncy, Peshawar District.

The R.A.M.C. Mess, opened in 1900, is going strong. Two general entertainments

were given this winter—one, a hunt breakfast, about eight miles out from cantonment, at which over one hundred guests were present, was considered a great success. On another occasion the R.A.M.C. Officers were "at home" to the Station, on the course, at a race meeting. Such expenditure as the up-keep of the Mess may throw on the individuals is amply compensated for by the comfort afforded to the members and their status in the Station.

Plague, which is this year rampant in the Punjab, has so far avoided Peshawar; only a few imported cases, in the persons of natives returning from plague-infected areas, have occurred.

A rather serious outbreak of rabies occurred during the early months of the present year. Seven British soldiers and some natives were bitten, all by different dogs, few of which were destroyed on the spot. A very strict weeding out of dogs has been enforced in the cantonment, and it is hoped there will be no recrudescence. All patients were sent to the Pasteur Institute at Kasauli, with, so far, satisfactory results.

Lieut.-Col. E. Ferrand, I.M.S., died in March, the result of a chill while snipe-shooting. He was much esteemed by all, and particularly by the officers of his own and of the sister service.

NOTES FROM THE PUNJAB.—Capt. Goodwin writes: "The following Hill Station appointments have been approved for the season 1904: Capt. J. Powell to command of the Station Hospital, Baragali, Capt. J. F. Martin to collateral command of the Station Hospital, Lower Topa, in addition to his present duties, viz., command of the Station Hospital, Upper Topa.

"Extract from India Army Orders dated May 30, 1904:—

"380. *Royal Army Medical Corps Examinations.*—At the examinations of Majors for promotion to Lieut.-Colonel, held in India in March, 1904, the undermentioned officers passed in the subjects prescribed in Appendix VIIIb., King's Regulations, headings (2) to (5): Major F. W. G. Hall, Major B. H. Scott.

"Extract from India Army Orders dated June 6, 1904:—

"393. *Royal Army Medical Corps Examinations.*—The undermentioned officers of the R.A.M.C. passed in subjects (h-ii) and (h-iii) at the examinations held in India in the month of March, 1904: Lieut. A. McMunn, Lieut. T. F. Ritchie (distinguished), Lieut. H. Rogers, Lieut. P. Davidson, D.S.O., Lieut. H. G. S. Webb."

NOTES FROM UMBALLA.—Major Morgan writes: "Last winter, at a meeting called by the Principal Medical Officer of the Sirhind District, Col. H. J. W. Barrow, R.A.M.C., a Medical Society was formed, and the District Medical Library, which had become out of date, was reorganised.

"The Society met fortnightly in the winter for the reading of papers or notes of cases of interest, the exhibition of patients, and discussion of professional and Corps matters. Its proceedings were opened by a paper by Col. H. J. W. Barrow, R.A.M.C., on 'The Treatment of Varicose Veins by Multiple Injections of Pure Carbolic Acid,' a method which in his hands, and after long experience, had met with unvarying success. Since then several very successful meetings have been held, amongst the papers read being the following: 'A Case of Liver Abscess attended by Difficulties of Diagnosis'; 'A Case of Arm Presentation in a Native Woman brought to Hospital Three Days in Labour'; 'A Case of Ruptured Tubal Pregnancy successfully treated by Operation'; 'A Case of Ear Disease with Suppurative Meningitis Simulating Cerebral Abscess.'

"The reorganisation of the Library has been equally successful, the stock of books having been brought up to date and supplemented by membership of Lewis's Circulating Medical Library, on the modest subscription of Rs. 2 per month per member.

"The success of both these undertakings has been largely due to the very keen interest taken in them by the P.M.O., Col. H. J. W. Barrow, R.A.M.C.

"A very promising cricket team was got together in Umballa last autumn, which bid fair to hold its own against all comers, when the extensive nature of the Punjab manoeuvres in December put an end to our hopes, in the dispersal of its leading members.

"Lieut.-Col. F. B. McLean, R.A.M.C., has lately been succeeded, as S.M.O. of Umballa, by Lieut.-Col. Woodhouse, R.A.M.C.

"Majors Brannigan, Fallon, Beyts, and Tyacke; Capts. Condon and Profeit, and Lieuts. Conway, Balck and Stores, have come to the district during the winter.

"Plague, which commenced here on Christmas Day, 1901, continues to prevail every year. In 1902 there were in Umballa, amongst the native population, 325 cases and 225 deaths; in 1903, 360 cases and 301 deaths. In 1902 there were three cases of pneumonic plague and one death amongst British troops; in 1903 none."

NOTES FROM JAMAICA.—Capt. T. E. Fielding writes: "There is an interregnum here just now since the late popular S.M.O., Col. Kenny, departed, much to the regret of the whole colony, civil as well as military. Prior to his departure a farewell dinner was given to him, his wife and daughter, by the officers of the R.A.M.C., and when he sailed a large number of friends turned out to see him off and wish him and his family 'God speed.'"

"The new S.M.O. has not yet arrived, so Major Hassard is acting S.M.O., and Capt. Samman is M.O.i/c Station Hospital, Upper Park Camp. Capt. Hodgens is M.O.i/c Station Hospital, Newcastle.

"Capt. French received his step on May 28.

"At the Annual Agricultural Show, held here in July, Capt. Samman kept up the end of the R.A.M.C. with conspicuous success. He carried away five first prizes in the following events: Tandem driving, single harness, riding imported horses, riding native horses, jumping."

NOTES FROM SIERRA LEONE.—Major Smith writes: "Major A. Pearse has gone home on completion of tour and of a short period of leave on a shooting trip into the hinterland. All R.A.M.C.'s are sorry to lose him. His record big-game bag for this part of the world has filled us all with envy and admiration.

"Capt. A. C. Thompson has also gone home.

"Capt. H. S. Taylor has arrived from England and taken up his residence in the White House, to do duty at Tower Hill.

"Lieut. Stanley, on return from sick-leave at the islands, has been posted to Mount Aureol instead of returning to Mabanta, where his place has been taken by Lieut. Seccombe.

"Capt. L'Estrange has gone to Port Lokkoh, and Lieut. Holden to Magbillen (the other two bush stations), in relief of Capt. Crean, V.C. (posted to Tower Hill) and Civil-Surg. Jones (resigned) respectively. Capt. Perry is in charge at Wilberforce.

"Sergt. Neeman, on arrival, has been posted to Wilberforce Hill, as senior N.C.O. of the Station Hospital there.

"The annual relief of Privates has taken place, and the old hands have gone home to a well-earned holiday.

BIRTHS.

ROBINSON.—On August 13, at Colchester, the wife of Lieut.-Col. S. C. B. Robinson, R.A.M.C., of a son.

GALLIE.—On August 4, at Forest Lodge, Standford, Liphook, Hants, the wife of Capt. J. Stuart Gallie, R.A.M.C., of a son.

MACDOUGALL.—August 17, at the Knoll, Blackheath, the wife of Capt. MacDougall, R.A.M.C., of MacDougall and Dunollie, Argyllshire, of a daughter.

MARRIAGE.

FLEURY-DOLBEY.—On July 26, at Christ Church, Lancaster Gate, by the Rev. P. R. Mitchell, Chaplain to the Forces, Bulford, Capt. C. M. Fleury, R.A.M.C., son of the late Col. W. L. Fleury, to Gladys, elder daughter of T. H. Dolbey, Barrister-at-law, of 54, Queensborough Terrace, Hyde Park, and 4, Essex Court, Temple.

DEATHS.

CROCKER.—On July 18, 1904, at West Malling, Kent, Henry Leonard, fourth son of the late Surg.-Gen. Alfred Crocker, Army Medical Department.

LONGMORE.—On July 13, 1904, at Middleton, Rothwell, Northampton, Assist.-Surg. Charles Longmore, aged 68. He entered the Service September 22, 1853, and was placed upon half-pay November 8, 1861.

GREENWAY.—On August 8, 1904, in Wynberg Hospital, Cape Town, Major John Henry Greenway, late R.A.M.C., aged 47. He entered the Service May 30, 1885, and was promoted Surg.-Major, May 30, 1897. He served in the South African War 1899-1901. Operations in Orange River Colony. Queen's Medal with two clasps.

TIPPETS.—Surg.-Major-Gen. A. M. Tippetts, late of the Army Medical Service, has died at Southsea at the age of 76 years. He qualified as a member of the Royal College of Surgeons in 1853, and joined the Medical Service of the Army as an Assistant Surgeon in April, 1854, serving in the Eastern Campaign of that and the following year with the 7th Fusiliers. He took part in the affair of Bulganac, in the battles of Alma and Inkerman, and in the Siege of Sebastopol, for which he had the medal with three clasps and the Turkish medal. As a Surg.-Major he also took part in the Afghan War of 1878-80, accompanying the expedition into the Bazar and Hissarik Valleys, for which he was mentioned in despatches and received his second medal. He became Deputy Surg.-Gen. in November, 1884, and retired in April, 1892, as a Surg.-Major-Gen. Major-Gen. Tippetts had been in receipt of a distinguished service reward since October, 1901. He married, in 1870, a daughter of Col. Deacon, C.B., of the 46th Regiment.

THE ROYAL ARMY MEDICAL CORPS FUND.

THIRTEENTH MEETING OF THE COMMITTEE.

THE Thirteenth Meeting of the Committee was held at 68, Victoria Street, S.W., on Friday, July 22, 1904, at 4 p.m.

Present.

Surg.-Gen. Sir William Taylor, K.C.B., K.H.P., Director-General A.M.S. (Chairman).

Surg.-Gen. H. Skey Muir, C.B., Representing Retired Officers.

Lieut.-Col. E. Fairland, Representing Retired Officers.

Lieut.-Col. J. F. Beattie, Representing Retired Officers.

Surg.-Gen. W. H. McNamara, C.B., C.M.G.

Major and Quarter-Master G. Merritt.

Attending.

Major H. C. Thurston, C.M.G.

(1) The Minutes of the Twelfth Meeting were confirmed.

(2) *Charitable Schools' Fund.*—All the children noted in Minute 6 of the last Meeting have been placed in schools noted, except boy R ——. The Royal Hibernian School has not accepted the latter, for whom arrangements are now being made for his reception in the Orphanage of St. Vincent de Paul, Glasnevin, at a charge of £17 pension and £3 infit; on his leaving the School, a further charge of £3 will be due for outfit.

(3) With regard to children put to school, it was agreed that charges from the school for outfit should be defrayed by the Charitable School Fund, and also charges for railway fares. It was further agreed that, in such cases where children have been placed in school, the question of the reduction of any monthly allowance which the parent may be receiving should be decided on the merits of each case by the Principal Medical Officer of the district in which he or she resides.

In reply to a question from a Principal Medical Officer as to whether the character and service of a non-commissioned officer or man should be taken into consideration when recommending a widow and family for assistance from the R.A.M.C. Fund, it was agreed that the character of the father should not be taken into consideration; the character of the widow, however, is a matter of importance.

(4) The quarterly accounts for the undermentioned Funds to June 30, 1904, presented by the Aldershot Sub-Committee, were considered and approved, and are appended to these Minutes:—

(a) Widows' and Orphans' Fund.

(b) General Relief Fund.

The Committee agreed that the pay of the clerk working on these two Funds should be £1 per quarter.

(c) Band Fund. A grant of £45 was made from the R.A.M.C. Fund to meet current expenses, including the purchase of one bombardon.

The Committee passed a cordial vote of thanks to Lieut.-Col. J. I. Routh, R.A.M.C., who has presented a pair of tympani, and to Lieut.-Col. H. W. Hubbard, R.A.M.C., who has presented an A clarinet to the Band.

(5) It was noted that the Misses Gordon collected £10 towards instituting a R.A.M.C. Cottage Home, under the Regimental Cottage Homes Fund. The latter

BALANCE SHEET FOR THE QUARTER ENDED JUNE 30, 1904.

ALDERSHOT, July 9, 1904.

(Signed) W. H. McNAMARA,
Surg.-Genl., A.M.S.

(Signed) H. A. HINGE, *Captain,*
Hon. Sec., Widows' and Orphans' Fund.

THE ROYAL ARMY MEDICAL CORPS COMPASSIONATE FUND.—GENERAL RELIEF FUND.

BALANCE SHEET FOR THE QUARTER ENDED JUNE 30, 1904.

RECEIPTS.				EXPENDITURE.			
Date.	From whom received.	On what account.	£ s. d.	Date.	To whom paid.	On what account.	£ s. d.
Jan. 21, 1904	Credit Balance from Last Quarter	.. ..	24 12 10	April 1, 1904	Various	Disbursements to Five	
	Lt.-Col. E. M. Wilson	Balance from Special				Cases requiring	
		Dinner Fund	0 9 11	June 30, 1904	Lt.-Col. E. M. Wilson	Monthly Relief	24 10 0
April 14, 1904	O.C. Depot, R.A.M.C.	By Sale of S. African		April 12, 1904	Sergt. H. Cassell	For Urgent Cases	5 9 11
		Kits	27 5 8	June 30, 1904	Balance at Bank	Clerk 7/6; Postage 1/8	0 9 2
„ 16, 1904	Hon. Sec. R.A.M.C.						71 19 4
	Fund	For General Relief	50 0 0				
		Total	£102 8 5			Total	£102 8 5

ALDERSHOT,

July 9, 1904.

(Signed) W. H. McNAMARA,

Surg.-Genl., A.M.S.

(Signed) H. A. HINGE, Captain,

Hon. Sec., General Relief Fund.

ROYAL ARMY MEDICAL CORPS BAND.—BALANCE SHEET.

APRIL—JUNE, 1904.

RECEIPTS.		EXPENDITURE.	
Date. 1904.	£ s. d.	Date. 1904.	£ s. d.
April 1 .. Credit Balance (Last Quarter)	8 18 1	April 30 .. Pay of Band (April)	19 11 8
" 16 .. Hon. Secretary, R.A.M.C. Fund (Quarterly Grant)	76 5 0	May 31 .. " (May)	20 3 6
" 18 .. President, R.A.M.C. Mess, Aldershot (March Subscriptions)	2 15 0	June 30 .. " (June)	19 19 2
Ditto (April Subscriptions)	6 10 0	Messrs. Hawkes & Son (New Instruments, Repairs, &c.)	37 8 7
Ditto (May Subscriptions)	6 12 6	Messrs. Gale & Polden (Programmes, &c.)	0 10 0
Interest on £5 (10 per cent.) for Services of Band at Netley, May 27th	0 10 0	Postage Account	0 4 3
Subscriptions from 143 Officers (5/-) received by Messrs. Holt & Co.	35 15 0	Capt. Cochrane, Refund of Subscriptions, years 1903 and 1904, being a Subscriber to R.A.M.C. Fund	0 10 0
		Balance	38 18 5
	<u>£187 5 7</u>		<u>£187 5 7</u>

ALDERSHOT,

July 9, 1904.

(Signed) W. H. McNAMARA,

Surg.-Genl., A.M.S.

(Signed) H. A. HINGE, Captain,

Hon. Sec., R.A.M.C. Band.

Fund is now closed, and the above ladies have transmitted the money collected by them to the R.A.M.C. Fund for use for General Relief, for which gift the Director-General has thanked them in the name of the Corps.

(6) With reference to the sum of £423 15s. 3d. remitted by Lieut.-Col. F. A. B. Daly, from his Military Hospital Mineral Water Factory at Standerton for the Widows' and Orphans' Fund, it was noted with satisfaction that the Lieut.-General Commanding in South Africa has approved of the money being placed in the General Relief Fund, as the Director-General pointed out that the latter Fund was the most beneficial charity for R.A.M.C. men, women, and children.

(7) The Trust Deed for the de Chaumont Prize, as amended, was considered and approved by the Committee.

With reference to the proposition that the Trust for the de Chaumont Prize should be held by the Director-General, Army Medical Services, and the Commandant of the Royal Army Medical College for the time being, without mentioning their names, it has been ascertained that Stock can only be registered in the name of a Corporation or the Paymaster-General for and on behalf of the Supreme Court of Judicature on receipt of the Order of the Court, except where specially authorised by Act of Parliament.

Under these circumstances the Committee agrees with the suggestion put forward by Messrs. Holt & Co., that the Stocks representing the Fund for the de Chaumont Prize should be invested in Stock Certificates to bearer, to be held by the Bankers of the R.A.M.C. Fund, to the Order of the Director-General and the Commandant of the Royal Army Medical College for the time being.

(8) The sum of £2 2s. 8d. has been handed over to the Officer commanding R.A.M.C. by the Regimental Cottage Homes' Committee on the closing of its Fund. This sum has been placed to the credit of the R.A.M.C. Fund for General Relief.

(9) The following sums have been received for the R.A.M.C. Fund, General Relief:—Netley Canteen Fund, £25; Major A. C. Freeman, £2; R.A.M.C. Regimental Institute, Middelburg, £50.

(10) The sum of £165 has been expended by the Fund towards the Corps Dinner for 1904.

(11) The following sums have been expended in connection with the pictures for the V.C. Gallery:—Expenses of Col. James and Artist to Wantage, £1 15s.; Photographer at Wantage, £1 15s.; Artist for first picture and expenses entailed in copying, £17 15s.

B. SKINNER, *Lieut.-Col.*,
Hon. Secretary.

July 23, 1904.

APPENDIX.

The following have received relief from the Fund during the quarter ended June 30, 1904:—

Widows' and Orphans' Fund.

Mrs. M., Skibbereen, widow of late Sergt.-Major, R.A.M.C. Granted £5 to help her in meeting her debts. Has previously (May, 1903) received £8.

Mrs. S., widow of late 1st Class Staff-Sergt. R.A.M.C. Granted £4 to assist her over the funeral and other expenses.

Child H., orphan of late 1601 Sergt. H., A.H.C.; £2 10s. paid to Secretary S.S.F.A., London, being half the fee required for the admission of the boy into the House Boy Brigade at Kensington, the other half being paid by the S.S.F.A.

The following grants have been continued from last quarter:—

Mrs. C., Chester, aged 33 years. Widow of 9938 Pte. Receives £1 5s. monthly.

Mrs. S., Netley, aged 56 years. Widow of pensioner. Receives £2 monthly.

Mrs. H., Chester, aged 44 years. Widow of No. 15532 Corpl. R.A.M.C. Receives £2 monthly.

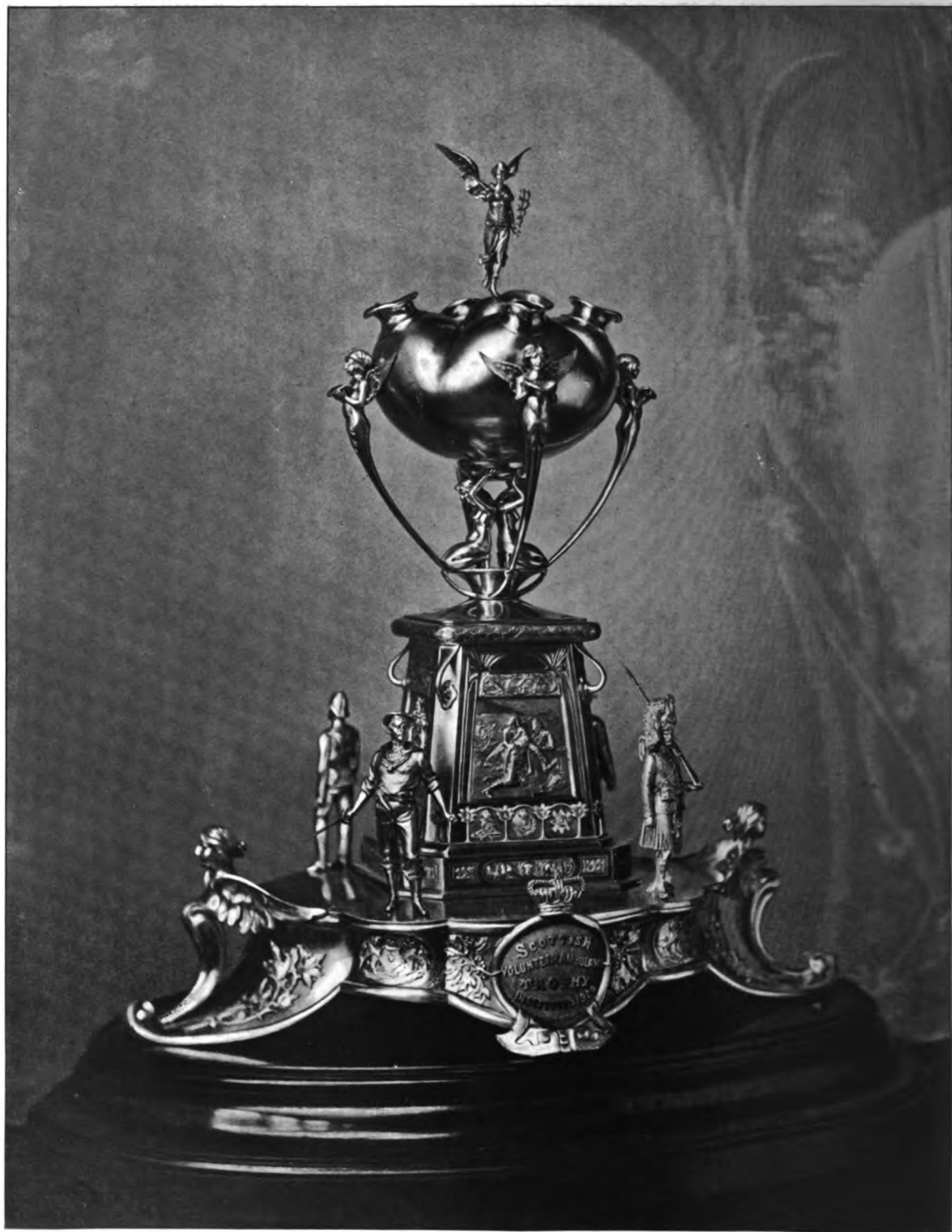
Mrs. S., London, aged 58 years. Widow of pensioner. Receives £1 10s. monthly.

Mrs. W., Colchester, aged 50 years. Widow of No. 15976 Pte. Receives £1 monthly.

Mrs. S., London, aged 41 years. Widow of No. 6049 1st Class Staff-Sergt. Receives £1 monthly.

Mrs. K., London, aged 64 years. Widow of pensioner. Receives £1 10s. monthly.

Mrs. I., Dublin, aged 62 years. Widow of pensioner. Receives £1 10s. monthly.



SCOTTISH VOLUNTEER AMBULANCE TROPHY.



Mrs. E., Dublin, aged 42 years. Widow of 2nd Class Staff-Sergt. Receives £2 monthly.

Mrs. S., Dublin, aged 60 years. Widow of Corpl. A.H.C. Receives £2 monthly.

Mrs. R., Dublin, aged 45 years. Widow of No. 2512 A.H.C. Receives £2 monthly.
Child P., Cahir, child of late 2nd Class Staff-Sergt. No. 7150. Guardian receives £1 5s. monthly.

Mrs. C., Norwich, aged 38 years. Widow of a Private. Receives £2 monthly.

Mrs. S., London, aged 36 years. Widow of a Private. Receives £2 monthly.

General Relief Fund.

Mr. F. A. L., Havant. Late 10001 Private N.S.C., receives £2 monthly, which was continued from last quarter. Is 34 years of age and not in receipt of a pension. Discharged medically unfit. Is married, with one child.

Mrs. M. B., London. Wife of 18153 Private R.A.M.C., receives £2 monthly, which was continued from last quarter. Aged 21 years.

Mr. E. W., Failsforth, Lanes. Late 9350 Private R.A.M.C., receives £1 10s. monthly, which was continued from last quarter. In receipt of a Government pension of 2s. 6d. a day. Unable to earn a living. Aged 36 years.

Mrs. S., Dublin. Wife of 16159 Private R.A.M.C., serving in South Africa. Receives £2 monthly, which was continued from last quarter. Aged 38 years.

Mrs. S., Tralee. Wife of late Private M.S.C., who is in a lunatic asylum. Received £2 in April, which was continued from last quarter. Is now discontinued, the original grant being made to help her over the winter.

Aldershot,

July 9, 1904.

(Signed) H. A. HINGE, *Capt.,*

Hon. Sec., General Relief Fund.

AMBULANCE COMPETITIONS—SCOTTISH VOLUNTEERS.

THE first annual competition for the Scottish Ambulance Trophy took place on Saturday, May 14, in the 1st L.R.V. Drill Hall, West Princes Street, Glasgow.

Surg.-Gen. Sir William Taylor presided, and among those present were Her Grace the Duchess of Montrose, Ladies Helen and Hermione Graham, Col. the Marquis of Breadalbane, Marquis of Graham, the Lord Provost, Sir John Ure Primrose, Bart., and Lady Primrose, Principal Story and Mrs. Story, Lieut.-Gen. Sir Charles Tucker, commanding the Scottish District; Col. Beatson and Miss Beatson, Col. F. W. Trevor, Col. Wilson, and Major Quintin Chalmers, President, and Capt. Halliday, Hon. Secretary of the Scottish Volunteer Medical Officers' Association.

The competition was a keen one, and in the end the 5th (Glasgow Highlanders) V.B.H.L.I. team were declared winners with 263 points out of a possible 300. The H.L.I. Brigade Bearer Company took second place with 245 points, the 3rd V.B.H.L.I. Glasgow, coming next with 221½.

At the conclusion of the contest the Lord Provost, in the name of the Corporation of Glasgow, the custodians of the cup, formerly returned it to Sir William Taylor for presentation to the winning team.

Sir William Taylor thanked the Corporation for their custody of the cup, and called upon Her Grace the Duchess of Montrose to present it to the winning team. It was well known, he added, not only in Glasgow, but all over the country, the deep and kindly interest which Her Grace took in benevolent work, and her kindness could not be better bestowed than in encouraging soldiers in the work of caring for their wounded comrades in the time of battle.

ARMY MEDICAL CANDIDATES—UNITED STATES.

THE examination of applicants for commission in the medical corps of the Army will be materially modified after July 1, when the amended regulations governing the matter will go into effect. Immediate appointment of applicants after successful physical and professional examination—the latter embracing all subjects of a medical education—will be discontinued; thereafter applicants will be subjected to a preliminary

examination and a final or qualifying examination, with a course of instruction at the Army Medical School in Washington intervening.

The preliminary examination will consist of a rigid inquiry into the physical qualifications of the applicants and written examinations in the following subjects: Mathematics (arithmetic, algebra and plane geometry), geography, history (especially of the United States), Latin grammar and reading of easy Latin prose, English grammar, orthography, composition, anatomy, physiology, chemistry and physics, materia medica and therapeutics, normal histology. The subjects in general education above mentioned are an essential part of the examination and cannot under any circumstances be waived.

The preliminary examination will be conducted concurrently throughout the United States by boards of medical officers at most convenient points; the questions submitted to all applicants will be identical, thus assuring a thoroughly competitive feature, and all papers will be criticised and graded by an Army Medical Board in Washington. Applicants who attain a general average of 80 per cent. and upward in this examination will be employed as contract surgeons and ordered to the Army Medical School for instruction as candidates for admission to the medical corps of the Army. If, however, a greater number of applicants attain the required average than can be accommodated at the school the requisite number will be selected according to relative standing in the examination.

The course of instruction at the Army Medical School will consist of lectures and practical work in subjects peculiarly appropriate to the duties which a medical officer is called upon to perform. While at this school the students will be held under military discipline, and character, habits and general deportment closely observed.

The final or qualifying examination will be held at the close of the school term, and will comprise the subjects taught in the school, together with the following professional subjects not included in the preliminary examinations: Surgery, practice of medicine, diseases of women and children, obstetrics, hygiene, bacteriology and pathology. General aptitude will be marked from observation during the school term. A general average of 80 per cent. in this examination will be required as qualifying for appointment, and candidates attaining the highest percentages will be selected for commission to the extent of the existing vacancies in the medical department. Candidates who attain the requisite general average who fail to receive commissions will be given certificates of graduation at the school, and will be preferred for appointment as medical officers of volunteers or for employment as contract surgeons. They will also be given opportunity to take the qualifying examination with the next succeeding class.

It is not thought that, for the present at least, the number successfully passing the preliminary examination will be greater than can be accommodated at the Army Medical School, nor that the number qualifying for appointment will exceed the number of vacancies. If, however, the class of candidates qualifying should be larger than reasonably thought, the young physicians who fail to receive commissions will not have wasted their time, as the course of instruction at the school, while in a large measure specialised to army needs, is such as will better fit them for other professional pursuits, and furthermore, they will have received a fair compensation while under instruction.

Admission to the preliminary examination can be had only upon invitation from the Surgeon-General of the Army, issued after formal application to the Secretary of War for permission to appear for examination. No applicant whose age exceeds 30 years will be permitted to take the examination, and the authorities at the War Department desire it distinctly understood that this limit of age will be rigidly adhered to. Hospital training and practical experience are essential requisites, and an applicant will be expected to present evidence of one year's hospital experience or its equivalent (two years) in practice.

The first preliminary examination under the amended regulations referred to will be held August 1, 1904. Those desiring to enter the same should at once communicate with the Surgeon-General of the Army in this city, who will be pleased to furnish all possible information in regard thereto.

THE QUEEN'S VISIT TO NETLEY.

On August 4 the Queen, accompanied by the Prince of Wales, Princess Victoria and suite, paid a visit to Netley, with the object of inspecting the new quarters of the Q.A.I.M.N.S.

The arrival of the Royal party, which was timed to take place at 2 p.m., unfor-

fortunately coincided with the advent of a severe thunderstorm, which prevented a landing until after 4 p.m. Upon debarking Her Majesty was met by the P.M.O., Sir E. Townsend, and by Lieut.-Col. Twiss, who accompanied her to the hospital. At the main entrance of the building the Royal party was received by Lieut.-Col. Sylvester and Major Blackwell, as well as by Major St. John, R.E., Miss Addams-Williams, the Matron, and Miss Neale, Q.A.I.M.N.S.

An immediate start was made for the new nursing quarters, which were looked at with considerable interest. Thereafter a visit was paid to both Surgical and Medical Divisions, where Her Majesty entered many of the wards and talked to the patients, as well as going into the Operating Theatre and X-ray Room. Finally a short visit to the kitchen brought the tour to a conclusion.

Her Majesty, being the recipient of a handsome bouquet presented by Lieut.-Col. Twiss's little daughter, drove off to re-embark on the Royal Yacht "Osborne" on her return journey to Cowes.

THE ROYAL ARMY MEDICAL CORPS BAND AT NETLEY.

THE Corps Band paid a visit to Netley from Monday, August 1, until early on Thursday, 11, and was the source of much enjoyment to the Staff of the hospital, the patients, and the residents in the vicinity.

On Monday evening it gave a concert on the Pier, which was attended by both the Staff and patients. On Tuesday it played an excellent selection at the Athletic Sports, and on Wednesday another on the Cricket Ground during the progress of a match.

ATHLETIC SPORTS AT NETLEY.

THE Annual Corps Sports took place at the Royal Victoria Hospital, Netley, on August 9, and were a great success. The day was fine and the going good. An excellent grass track had been prepared, and competition in most of the events was keen. An early start was necessary to enable a long programme of thirty-one events to be got through before dark. As a result of much forethought and attention to detail, the comfort of both spectators and competitors was amply provided for, and the many friends of the Staff who were present on the grounds spent an enjoyable afternoon. The services of the Corps Band were obtained from Aldershot and contributed in a large degree to the success of the day. The opinion was unanimous and was freely expressed that it had never before been heard to such advantage in the neighbourhood. The programme of music was of a varied character, and was well carried out under the able guidance of the Bandmaster, Mr. Bennett. The sports themselves were closely watched by and evoked much enthusiasm among the spectators, the favourite events being perhaps the Bicycle Races, the Stretcher Competition, and the Obstacle Race. As usual, the sight of others in difficulty seemed to fill those more fortunately situated with considerable gratification, and good-natured banter was largely indulged in.

Sir E. Townsend and the Officers were "At Home" to a large number of friends during the afternoon.

Below is a list of the events, with the names of winning competitors, who received their various prizes at the kindly hands of Lady Townsend.

Football place kick, two tries (open to Corps).—1, Hodgston (50 ft.); 2 Perkins; 3, Smith.

Throwing the cricket ball (open to Corps).—1, Leriche (98½ ft.); 2, Dell; 3, Avery.

Putting the shot (7-ft. run).—1, Green (27 ft. 5 in.); 2, Rowbotham.

Long jump (3 tries).—1, Davis (16 ft. 7 in.); 2, Maloney.

Flat race, 100 yards.—1, Worth; 2, Pitt; 3, Rowbotham.

Ditto, for boys under 14 years of age, 100 yards.—1, Prince; 2, Schooler; 3, Cudmore.

Ditto, for girls under 14 years of age, 100 yards.—1, May; 2, Plaw; 3, Brewer and Slater (tie).

Ditto, one mile (open to Corps)—1, Penny; 2, Davis; 3, Howard.

Mop tournament. —1, Wells and Larkin; 2, Prentice and Mosley.

High jump.—Larkin and Warr (tied at 4 ft. 10 in.).

- Quarter-mile race.—1, Howard ; 2, Worth ; 3, Watts.
 Bicycle race, two miles.—1, Henley ; 2, Prett ; 3, Grogan.
 Three-legged race, 100 yards.—1, Worth and Wells ; 2, Prentice and Rowbotham ;
 3, Smith and Edwards.
 Half-mile race.—1, Penny ; 2, Watts ; 3, Howard.
 Bicycle race, three miles (open to Corps).—1, Penny ; 2, Henley ; 3, Goodwin.
 Stretcher competition, with tent pitching (open to Corps).—1, I Coy. (Aldershot) ;
 2, B Coy. (Depôt, Aldershot).
 Bucket of water race, 70 yards.—1, Prentice ; 2, Pitt ; 3, Camp.
 Sack race and turn, 50 yards.—1, Rowbotham ; 2 Prentice ; 3, Larkin.
 N.C.O.'s race, 150 yards.—1, Lce.-Corpl. Howard ; 2, Lce.-Corpl. Grogan.
 Best turned-out man in marching order.—1, Pte. Young ; 2, Bugler Prince.
 Climbing greased pole.—1, Rowbotham.
 Tortoise bicycle race, 100 yards ; last man in wins ; back wheel to be kept moving ;
 course not to be zig-zagged beyond a yard ; a fall disqualifies.—1, Bogosoff ; 2, Grogan.
 Tug-of-war, teams of ten men, not to exceed a total weight of 110 stone.—1, Corpl.
 Brook's team.
 Potato race.—1, Larkin ; 2, Prentice ; 3, Prett.
 Obstacle race (2s. each for completion of course).—1, Penny ; 2, Larkin ; 3, Worth.
 Band race, once round course (each competitor to play instrument as supplied).—1,
 Koffe ; 2, Sterling ; 3, Coventry.

MEMORIAL TO THE LATE LIEUT.-COL. E. R. CREE.

LIEUT.-COL. C. R. TYRRELL desires to inform the officers who subscribed to a memorial to the late Lieut.-Col. E. Russell Cree that a suitable inscription has been placed on the tablet in the Garrison Church at Aldershot reserved for officers of the R.A.M.C. A small balance remaining, amounting to £4 4s., has been handed over to the General Relief Branch of the Compassionate Fund of the Royal Army Medical Corps, and Lieut.-Col. Tyrrell hopes that this will meet with the approval of the subscribers.

REPORT OF THE STATE OF
THE FRIENDLY SOCIETY
OF THE OFFICERS OF THE MEDICAL DEPARTMENT OF THE ARMY.
Laid before Eighty-Ninth Annual General Meeting at the Army Medical Board, London, on Monday, June 13, 1904.
Deputy Surgeon-General C. A. INNES, M.D., President, in the Chair.
Secretary—Col. T. LIGERTWOOD, M.D., C.B., 16, St. Leonard's Terrace, Chelsea, S.W., by whom Subscriptions will be received.

STATEMENT OF ACCOUNTS FROM JANUARY 1 TO DECEMBER 31, 1903.

Dr.	OLD ACCOUNT.				Cr.			
	1903		1902		1903		1902	
	£	s. d.	£	s. d.	£	s. d.	£	s. d.
To Balance as per account, 1902 .. ..	..	129 0 11	90 12 9					
By Cash Subscriptions—								
1st Class Married Subs. .. £12 0 0	£12	0 0			1,659	2 0	1,754	12 3
1st " Unmarried " .. ..	..	..	..	..	27	3 7	59	16 8
2nd " Married " .. ..	..	..	..	..	..	..	..	..
2nd " Unmarried " .. ..	..	..	..	..	150	0 0	150	0 0
Half Year's Interest on Invested Capital to May 20, 1903, 181 days .. ..	..	12 0 0	12 0 0		60	0 0	60	0 0
Half Year's Interest on Invested Capital to November 20, 1903, 184 days .. ..	..	1,516 6 2	1,516 11 0		18	6 4	17	1 6
Cash, withdrawn from Funded Capital to pay Annuities .. ..	..	1,551 6 7	1,570 14 11		3,067	12 9	3,087	5 11
Cash, Interest on ditto at dates of withdrawal .. ..	..	2,000 0 0	2,100 0 0		57	16 4	..	..
Cash paid Actuary .. ..	..	38 2 6	1 10 7		..	..	33	12 0
Balance carried forward to January 1, 1904 .. ..	..	..	..		201	15 2	129	0 11
	£5,241	16 2	£5,291 9 3		£5,241	16 2	£5,291 9 3	

Annuities due but not yet paid, amounting to £28 17s. 1d.

Number of Annuity—1st Class, 85; 2nd Class, 1; Total, 86; being a Decrease of 1.

Cash Account with the Commissioners for the National Debt, 1903.

Amount of Invested Capital as per last Report, to December 31, 1902	£81,428 13 4
" Invested during the year 1903	8,067 12 9
	£89,491 6 1
Cash withdrawn to pay Annuity	2,000 0 0
	£87,491 6 1

Dr.	NEW ACCOUNT, No. 1.		Cr.	
	1903	1902	1903	1902
	£ s. d.	£ s. d.	£ s. d.	£ s. d.
To Balance as per Account, 1902	367 9 1	585 3 7		
By Cash Subscriptions:—				
1st Class Married Subs. .. £534 10 0				
1st " Unmarried " .. 24 0 0			1,805 9 8	1,727 16 3
2nd " Married " .. 8 0 0			740 14 2	745 9 0
2nd " Unmarried "			57 5 5	..
Marriage Fines.. ..				
One Year's Dividend on £7,827 5s. 7d. Two- and-a-Half per Cent. Debenture Stock, Midland Railway (less Tax £11 8s. 4d.)				
One Year's Dividend on £5,000 Three per Cent. Debenture Stock, London and North Western Railway (less Tax £8 15s. 0d.).. ..	566 10 0	559 10 1		
One Year's Dividend on £1,449 Four per Cent. Debenture Stock, Caledonian Rail- way (less Income Tax £3 0s. 8d.) ..	44 15 0	69 10 0		
Half-Year's Interest on Invested Capital to May 20, 1903, 181 days	184 5 4	184 1 8		
Half-Year's Interest on Invested Capital to November 20, 1903, 184 days	141 5 0	141 1 10		
Cash withdrawn from Funded Capital to pay Annuity	54 18 6	54 8 7		
Cash, Interest on ditto at date of withdrawal	370 11 7	366 17 5		
	370 2 7	378 11 7		
	800 0 0	500 0 0		
	10 8 0	1 10 0		
	£2,910 5 1	£2,840 14 4		
			£2,910 5 1	£2,840 14 4

Number of Annuity, 1st Class, 39, being an increase of 2.

Cash Account with the Commissioners for the National Debt, 1903.

Amount of Invested Capital as per last Report to December 31, 1902	.. ..	£24,569 7 11
" Invested during the year 1903 .. ..	.. ..	740 14 2
		£25,310 2 1
Cash withdrawn to pay Annuity .. ..	.. ..	800 0 0
		£24,510 2 1

Dr.	NEW ACCOUNT, No. 2.						Cr.	
	1903		1902		By Balance carried forward to January 1, 1904		1903	1902
	£	s. d.	£	s. d.	£	s. d.	£	s. d.
To Balance as per Account, 1902	980	14 4	589	8 11	1,279	8 8	980	14 4
" " Cash Subscriptions—								
1st Class Married Subs.	£221	10 1						
1st " Unmarried "	16	0 0						
" Marriage Fines			231	17 1				
" One Year's Dividend on £2,619 3s. Od.			42	0 0				
" Consols (less Tax £3 15s. 3d.)	64	19 10	67	13 4				
	<u>£1,279</u>	<u>8 8</u>	<u>£980</u>	<u>14 4</u>			<u>£1,279</u>	<u>8 8</u>

Dr.	NEW ACCOUNT, No. 3.						Cr.
	1903			1902			
	£	s.	d.	£	s.	d.	
To Balance as per Account, 1902	..	..	..	101	15	9	By Balance carried forward to January 1, 1904
„ Cash Subscriptions—							
1st Class Married ..	£22	0	0				
1st „ Unmarried ..	12	18	10				
				34	18	10	
				22	0	0	
				£136	14	7	
				£101	15	9	

		Old Account.				New Account, No. 1.				New Account, No. 2.				New Account, No. 3.				Total amount of all Monies belonging to the Society, December 31, 1903			
		£	s.	d.		£	s.	d.	£	s.	d.	£	s.	d.	£	s.	d.	£	s.	d.	
a	Amount of Cash with the Commissioners for the National Debt ..	83,491	6	1	5,000	0	0	196	14	7	
	Balance in hand ..	201	15	2	1,449	0	0	123,115	17	11	
		£83,693	1	3					7,827	5	7							£23,747	18	1	
									£14,276	5	7										
	Deduct Annuities due but not yet drawn	
	Income Tax deducted from Annuities	
	Secretary's Salary and Office Allowance from October 1, 1902, to December 31, 1903	
		£23	17	1					£3,763	9	6				£468	9	10				
					1,550	14	4				2,000	0	0				
					6,685	10	11										
					£11,999	14	9				£1,279	8	3				
					£24,713	0	4				£2,468	9	10				
					£24,510	2	1										
					303	9	8										
					£24,813	11	9										
					100	11	5										
					£24,713	0	4										
					£24,518	10	2										
					£24,510	2	1										
					303	9	8										
					£24,813	11	9										
					100	11	5										
					£24,713	0	4										
					£24,510	2	1										
					303	9	8										
					£24,813	11	9										
					100	11	5										
					£24,713	0											

NOTE.—The Railway Stock and Consols are quoted at cost price according to the requirements of the Registrar General.

REPORT

OF THE STATE OF

THE ARMY MEDICAL OFFICERS' BENEVOLENT SOCIETY.

Laid before the Eighty-Third Annual General Meeting at the Army Medical Board, London, on Monday, June 13, 1904.

Deputy Surgeon-General C. A. INNES, M.D., in the Chair.

Secretary—Col. T. LIGERTWOOD, M.D., C.B., 16, St. Leonard's Terrace, Chelsea, S.W., by whom Subscriptions will be received.

Dr.			Cr.		
STATEMENT OF THE RECEIPTS AND EXPENDITURE FROM JANUARY 1 TO DECEMBER 31, 1903.					
	£	s. d.		£	s. d.
To Balance brought forward January 1, 1903	451	1 0	By Donations granted at the Annual General Meeting on June 15, 1903	615	0 0
" Cash Subscriptions	..	..	" Special Donations	135	0 0
" " Donations	..	..	" Secretary's Salary from October 1, 1902, to September 30, 1903	50	0 0
" One Year's Dividend on £6,667 Three per Cent. Debenture Stock, London and North Western Railway (less Tax £11 13s. 4d.)	149	14 6	" Postages, Stationery, Printing, &c., from October 1, 1902, to September 30, 1903	12	12 2
" One Year's Dividend on £6,400 Two-and-a-Half per Cent. Debenture Stock, Midland Railway (less Tax £9 6s. 8d.)	188	6 10	" Purchase of £109 7s. 7d. Two-and-a-Half per Cent. Consols at 91 ¹ / ₁₆	100	0 0
" One Year's Dividend on £6,666 Three per Cent. Debenture Stock, North Eastern Railway (less Tax £11 13s. 5d.)	150	13 4	" Purchase of £113 3s. 6d. Two-and-a-Half per Cent. Consols at 88 ¹ / ₄	323	7 4
" One Year's Dividend on £2,780 Four per Cent. Debenture Stock, Caledonian Railway (less Tax £5 16s. 6d.)	105	7 6	" Balance carried forward to January 1, 1904	1,835	19 6
" Half Year's Dividend on £109 7s. 7d. Two-and-a-Half per Cent. Consols	1	7 4			
" Cash, Commissioners of Inland Revenue, rebate of Income Tax, 1900, 1901, 1902	101	2 10			
	£1,835	19 6			
London and North Western Railway Three per Cent. Debenture Stock			£6,667 0 0		
Midland Railway Two-and-a-Half per Cent. Debenture Stock			6,400 0 0		
North Eastern Railway Three per Cent. Debenture Stock			6,666 0 0		
Caledonian Railway Four per Cent. Debenture Stock			2,780 0 0		
Two-and-a-Half per Cent. Consols			233 11 1		
			£22,735 11 1		

NOTICE TO SUBSCRIBERS.

OFFICERS are particularly requested to give timely notice of changes of station or changes of address, in order to ensure the posting of the JOURNAL to its correct destination.

The Editor will be glad to receive original communications upon professional subjects, travel, and personal experiences, &c. He will also be glad to receive items of news and information regarding matters of interest to the Corps from the various garrisons, districts and commands at home and abroad. All these communications should be written upon one side of the paper only, they should by preference be type-written, but, if not, all proper names should be written in capital letters (or printed) to avoid mistakes, and be addressed to the Editor, JOURNAL OF THE ROYAL ARMY MEDICAL CORPS, 68, Victoria Street, London, S.W.

Letters regarding subscriptions, non-delivery of the JOURNAL, or change of address, should be sent to Major T. McCulloch, R.A.M.C., 68, Victoria Street, London, S.W.

Communications have been received from Lieut.-Cols. H. E. Deane, C. R. Bartlett, W. B. Thomson, J. G. MacNeece, C. Birt, W. G. Don (retired), W. G. Macpherson, E. Fairland, G. Coutts, J. Battersby; Majors F. Smith, E. C. Freeman, F. W. Begbie, A. R. Aldridge, N. Faichnie, M. P. Holt, W. B. Leishman; Capts. T. McDermott, E. T. F. Birrell, H. C. French, P. M. Mangin, P. S. Lehan, F. Kiddle, E. V. Ayles; Lieut. N. E. Harding; Sergt. W. Merchant; E. E. Austen, Esq.

In the event of reprints of articles being required by the authors, notification of such must be sent when submitting the papers. Reprints may be obtained at the following rates:—

	s.	d.		s.	d.		s.	d.
25 Copies of 4 pp.	4	6	Of 8 pp.	7	6	Extra for covers	4	0
50 " "	5	6	" "	9	0	" "	5	0
100 " "	7	6	" "	12	6	" "	6	6
200 " "	11	6	" "	19	0	" "	9	0

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Covers, 1s. 4d. net; binding, 1s. 2d.

These charges are exclusive of cost of Postage.

In forwarding parts for binding the name and address of sender should be enclosed in parcel.

The following periodicals have been received: *The Medical Record*, *The Medical News*, *New York Medical Journal*, *American Medicine*, *Gazette Med. de Paris*, *Archives de Medicine et de Pharmacie Militaires*, *Il Morgagni*, *Gazetta Medico-Italiana*, *The Medical Review*, *El Siglo Medico*, *Der Militärarzt*, *Deutsche Militärärztliche Zeitschrift*, *Anales de Sanidad Militar*, *Revue Med. de la Suisse Romande*, *La Medicina Militar Espanola*, *The Boston Medical and Surgical Journal*, *Annali di Med. Navale*, *Giornale del Regio Esercito*, *Le Caducée*, *The Hospital*, *The Ophthalmoscope*, *St. Thomas's Hospital Gazette*, *Bulletin de l'Acad. de Med. de Paris*, *Arch. Med. Belges*, *Voyenno Medisinskii*, *The Indian Medical Gazette*, *The Australasian Medical Gazette*, *Journal of the Association of Military Surgeons, U.S.*, *Militärlagen unguet af Militärlaegeforeningen*, i Kjobenhavn, *The Veterinary Journal*, *The Practitioner*, *Public Health*, *Medical Review*, *Journal of Infectious Diseases*, *Chicago*, *The Army and Navy Gazette*, *The United Service Gazette*, *Journal of the Royal United Service Institution*, *The Johns Hopkins Press*.

We desire to remind members who paid their first year's subscription by cheque or postal order that the annual subscription is due on July 1, and it is very important that such should be promptly paid.

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NOTICE.

The Corps News is now printed as an inset to the Journal and separate copies may be subscribed for, price 2d. monthly.

JOURNAL

OF THE

ROYAL ARMY MEDICAL CORPS.

Corps News.

OCTOBER, 1904.

ROYAL ARMY MEDICAL CORPS.

The undermentioned gentlemen to be Lieutenants on probation, dated July 30, 1904 :—
William Byam ; Charles Ryley ; Harry Theodore Wilson ; Lionel Victor Thurston ;
Walter Hyde Mills, M.B. ; Patrick Dwyer, M.B. ; Philip Claude Tresilian Davy, M.B. ;
John Forbes Cook Mackenzie, M.B. ; Arthur William Gater ; George Alfred Duncan
Harvey ; Harold Charles Winckworth ; James Campbell, M.B. ; Richard Collis Hal-
lowes, M.B. ; Harry William Russell, M.B. ; George Richard Painton ; Maurice Sinclair,
M.B. ; Evelyn John Hansler Luxmoore ; Kenneth Alan Crawford Doig ; Herbert Owen
Marsh Beadnell ; Herbert St. Maur Carter, M.D. ; Robert Harry Lucas Cordner ; John
Patrick Lynch ; Alastair Norman Fraser, M.B. ; Nelson Low ; Percy Arnold Jones ;
Cecil Roy Millar ; Augustine Thomas Frost, M.B. ; George Herbert Richard ; Harry
Christopher Sidgwick, M.B. ; John St. Aubyn Maughan.

Major H. C. Thurston, C.M.G., R.A.M.C., to be a Deputy-Assistant-Director-
General, *vice* Lieutenant-Colonel E. M. Wilson, C.B., C.M.G., D.S.O., R.A.M.C., who
has resigned that appointment, dated August 18, 1904.

The undermentioned Lieutenants are seconded under the provision of Article 349 of
the Pay Warrant: W. Byam, dated July 30, 1904 ; H. St. M. Carter, M.D., dated
July 30, 1904.

Lieutenant F. M. M. Ommamney is seconded for service under the Foreign Office,
dated August 12, 1904.

Lieutenant J. A. Longley, M.B., from the seconded list, to be Lieutenant, dated
August 21, 1904.

The following appears in the *London Gazette* dated September 6, 1904 :—

"The King has been graciously pleased to give orders for the following appointments
to the Most Honourable Order of the Bath, in recognition of the services of the under-
mentioned officers during the operations in Somaliland :

"To be Ordinary Members of the Military Division of the Third Class, or Com-
panions, of the said Most Honourable Order, *viz.*, Colonel John Francis Williamson,
C.M.G., R.A.M.C."

"The King has also been graciously pleased to give orders for the following appoint-
ments to the Distinguished Service Order, and promotions in the Army, in recognition
of the services of the undermentioned officers during the operations in Somaliland ; the
promotions to bear date of September 7, 1904.

"To be Companions of the Distinguished Service Order, *viz.*, Captain Albert Ernest
Hamerton, R.A.M.C.

"Lieutenant-Colonel P. M. Ellis to be Colonel, *vice* R. Blood, M.D., retired, dated
August 13, 1904.

Lieutenant-Colonels H. J. R. Moberley and W. G. A. Bedford, C.M.G., have been selected for increased pay.

Lieutenant-Colonel L. B. Ward has resigned the retired pay appointment at Wrexham.

The under-mentioned retired officers have been appointed to the charges specified: Lieutenant-Colonel J. Osburne, Galway; Lieutenant-Colonel G. T. Trewman, Reading; Major T. Butterworth, Carlisle.

Captain D. J. Collins has obtained the D.P.H. Dublin.

Captain J. C. B. Statham has obtained the D.P.H. London, and also the Diploma in Tropical Medicine and Hygiene of Cambridge University.

Major C. T. Blackwell has obtained the D.P.H. London.

Major N. Faichnie has obtained the D.P.H. London.

Major N. Faichnie has been appointed Sanitary Officer in the North-Eastern and North-Western Districts.

Major N. Fayrer has been appointed to the Duke of York's School, *vice* Captain E. B. Steel, who resigns the appointment.

The following Majors qualified in Technical Subjects for the rank of Lieutenant-Colonel at the examination held at Home stations in May last:—

H. P. G. Elkington; S. Powell, M.B. ("D." in Army Medical Organisation); J. V. Salvage, M.D.; H. M. Adamson, M.B.; C. J. W. Tatham; F. S. L. Quesne, V.C. ("D." in Special Subject); S. F. Clark, M.B.; F. W. H. D. Harris; W. H. Pinches; S. N. Cardozo ("D." in Army Medical Organisation); H. J. Fletcher, M.B.; W. C. Beevor, M.B., C.M.G. ("D." in Special Subject); A. E. Morris, M.D. ("D." in Special Subject); S. G. Allen ("D." in Special Subject); H. A. Haines, M.D.; H. H. Brown, M.B.; D. Henessy, M.D.; H. Cocks, M.B.; M. J. Whitty, M.D.; Lieutenant W. F. Ellis for the rank of Captain.

The following qualified in Military Law at the same examination:—

Majors H. P. G. Elkington; H. M. Adamson, M.B. ("D."); C. J. W. Tatham; W. H. Pinches; H. E. Cree; H. J. Fletcher, M.B.; R. Holyoake; W. C. Beevor, M.B., C.M.G.; A. E. Morris, M.D.; H. A. Haines, M.D. ("D."); H. H. Brown, M.B.; H. Cocks, M.B.; G. M. Dobson, M.B.; Captains E. S. Clark, M.B.; F. Kiddle, M.B.; Lieutenant W. F. Ellis.

The following Majors qualified in the subjects noted against their names:—

R. Holyoake in Sanitation and Epidemiology and Special Subject; M. L. Hearn in Sanitation and Epidemiology; C. Garner, M.B., in Sanitation and Epidemiology and Special Subject.

The following Majors, at stations abroad, at the examination held in May last, qualified for the rank of Lieutenant-Colonel in Technical Subjects, viz.:—

C. H. Burtchael, M.B. ("D." in Army Medical Organisation); E. Eckersley, M.B. ("D." in Army Medical Organisation); and Bt. Lieutenant-Colonel C. Birt.

The following Majors have passed in "Army Medical Organisation" and "Sanitation and Epidemiology":—

H. T. Knaggs, M.B.; R. H. Penton, D.S.O.

The following Majors passed at the examination in May last in "Military Law" for the rank of Lieutenant-Colonel:—

C. S. Sparkes; C. H. Burtchael, M.B.; "D." E. Eckersley, M.B.; H. T. Knaggs, M.B.; Bt. Lieutenant-Colonel C. Birt.

List of Captains, Royal Army Medical Corps, who have passed the examination qualifying them for promotion to the rank of Major, Royal Army Medical College, January, 1904: S. W. Sweetnam, W. S. Harrison (Bacteriology), L. F. Smith (Specific Fevers), S. H. Fairrie (Midwifery and Gynaecology), J. V. Forrest, H. W. Grattan (Bacteriology), J. H. Campbell (Midwifery and Gynaecology), E. W. Bliss, (Operative Surgery), J. C. B. Statham (Bacteriology), E. C. Hayes (Ophthalmology), A. H. Waring (Skiagraphy), E. W. W. Cochrane (Bacteriology), A. H. Morris (Bacteriology), A. J. MacDougall (Bacteriology), R. W. Clements (Skiagraphy), M. Swabey (Pædiatrics), W. E. Hudleston (Specific Fevers), T. H. M. Clarke, E. W. P. V. Marriott (Skiagraphy), C. H. Hopkins (Specific Fevers), A. C. Lupton, E. A. Bourke (Specific Fevers). *Failed to qualify*: G. B. Riddick.

The following appeared in the Dispatches, &c., relating to the Somaliland Expedition, published in the *London Gazette* of September 2, 1904:—

"Brigadier-General W. H. Mannings, C.B., report upon the operations of the Somaliland Field Force.

"Lieutenant-Colonel J. F. Williamson, C.M.G., R.A.M.C., as Principal Medical Officer, has efficiently organised the medical arrangements of the Somaliland Field Force under conditions of peculiar difficulty.

"Lieutenant-General Sir C. C. Egerton's report. (Headquarter Staff.)

"Colonel J. F. Williamson, C.M.G., R.A.M.C., Principal Medical Officer. His great and varied war experience has made him a most valuable Administrative Medical Officer. The arrangements for the care of the sick and wounded and their transport over some 350 miles of desert on occasions have been admirable.

"MEDICAL DEPARTMENT.

"The following are brought to special notice by the Principal Medical Officer as having done particularly valuable work:—

"Captain A. E. Hamerton, R.A.M.C.

"MEDICAL SERVICES.

"Especially brought to notice, in the order named, by the Principal Medical Officer:—

"Captain S. de C. O'Grady, R.A.M.C.

Report of Colonel A. N. Rochfort, C.B., R.A., on the operations carried out by the Abyssinian forces.

"(SPECIAL SERVICE OFFICERS.)

"Major J. W. Jennings D.S.O., R.A.M.C., by his sympathy and unremitting attention to the sick, won the esteem of all those with whom he came in contact."

VOLUNTEER CORPS.

2nd Volunteer Battalion the King's (Shropshire Light Infantry).—Surgeon-Captain G. Hollies, M.D., to be Surgeon-Major, dated August 20, 1904.

1st Volunteer Battalion the Manchester Regiment.—Surgeon-Major W. M. Roocroft to be Surgeon-Lieutenant-Colonel, dated August 20, 1904.

1st Kent.—Sanderson Mellor, Gent., late Lieutenant 6th West Riding of Yorkshire Rifle Volunteer Corps, to be Surgeon-Lieutenant, dated July 16, 1904.

3rd (Dumfries) Volunteer Battalion the King's Own Scottish Borderers.—Super-numerary Surgeon-Lieutenant G. R. Livingston, M.B., to be Surgeon-Captain, and to remain Supernumerary, dated September 3, 1904.

4th (Donside Highland) Volunteer Battalion the Gordon Highlanders.—Samuel George Davidson, Gent., late Surgeon-Lieutenant, to be Lieutenant, dated July 16, 1904.

1st Forfarshire.—Surgeon-Lieutenant W. A. Taylor, M.B., to be Surgeon-Captain, dated September 10, 1904.

2nd Volunteer Battalion the King's Own (Royal Lancaster Regiment).—Surgeon-Lieutenant B. W. Hogarth, M.D., to be Surgeon-Captain, dated September 10, 1904.

3rd Volunteer Battalion the Cheshire Regiment.—Surgeon-Lieutenant T. A. Rothwell, M.D., to be Surgeon-Captain, dated September 10, 1904.

3rd (Sunderland) Volunteer Battalion the Durham Light Infantry.—William Byron Milbanke, M.B., to be Surgeon-Lieutenant, dated September 10, 1904.

The London Companies.—Major T. H. Openshaw, M.B., F.R.C.S., C.M.G., resigns his commission, with permission to retain his rank and to wear the prescribed uniform, dated August 27, 1904.

The Woolwich Companies.—Lieutenant W. H. Payne to be Captain, dated August 27, 1904.

ARMY MEDICAL RESERVE OF OFFICERS.

Surgeon-Major W. M. Roocroft to be Surgeon-Lieutenant-Colonel, dated August 2, 1904.

Surgeon-Major J. P. Atkinson, M.D., having attained the prescribed limit of age, is removed from the Army Medical Reserve of Officers, dated July 31, 1904.

The notification regarding the promotion of Surgeon-Captain C. E. L. B. Hudson, F.R.C.S. Eng., notified in the *Gazette* of July 26, 1904, is cancelled.

Surgeon-Lieutenant A. H. L. Stewart, 2nd County of London Imperial Yeomanry, to be Surgeon-Lieutenant, dated September 7, 1904.

IMPERIAL YEOMANRY.

Hertfordshire.—The appointment of Surgeon-Lieutenant George Smith Ward, which was announced in the *London Gazette* dated March 18, 1904, bears date May 5, 1903, and not as therein stated.

ARRIVALS HOME.—From South Africa: Lieutenant-Colonels T. M. Corker and R. L. Love; Captains G. J. A. Ormsley and W. B. Winkfield. From Somaliland: Captain F. H. Handy.

ARRIVALS HOME ON LEAVE.—Colonel W. O. Wolseley; Majors H. T. Knaggs and T. Birt; Captains E. Ryan, H. R. Bateman, J. W. Langstaff, R. N. Woodley, W. H. S. Nickerson, V.C., and C. W. Profeit.

EMBARKATIONS.—North China: Major M. L. Hearn. West Africa: Captains L. F. Smith, E. W. Bliss, and J. V. Forrest. South Africa: Colonel W. W. Kenny. India: Majors W. E. Beevor, C.M.G., and F. A. Saw; Captain E. S. Clark.

POSTINGS.—Lieutenant-Colonel J. C. Culling to Pembroke Dock; Captains E. J. Dobbin, H. Herrick and F. H. Hardy, to Aldershot; Lieutenant-Colonel T. W. O'H. Hamilton, Major J. A. O. MacCarthy, and Captain G. A. Ormsby, to Ireland; Captains E. T. Inkson, V.C., and W. B. Winkfield, to Southern District; Major F. W. H. D. Harris to Western District; Major N. Faichnie to York.

ROYAL ARMY MEDICAL CORPS.

CASUALTIES from August 11 to September 10 inclusive:—

Discharges.—18286 Private A. H. Green, medically unfit, August 16; 19141 Private J. Wood, purchase, August 13; 5595 Quarter-Master-Sergeant A. E. Haurahan, 2nd period, August 26; 8177 Sergeant A. C. Upton, medically unfit, August 30; 11637 Corporal G. P. N. Angus, 1st period, September 4; 19182 Private R. Rayment, purchase, August 30; 12581 Private W. Ralston, medically unfit, September 5; 3002 Staff-Sergeant J. H. Humphreys, termination of engagement, September 5.

Transfers to Army Reserve.—15237 Private W. Clark, 15578 Private E. C. Hammond, 15004 Private A. Heron, 15579 Private G. L. Lyons, 15191 Private W. Mason, 15581 Private J. McCavert, 14989 Private H. Reid, 15061 Private H. Shannon, 14998 Private E. Sharples, 14806 Private A. Smith, 15546 Private J. T. Spencer, 14994 Private T. Wright, August 13; 15547 Private H. W. Joy, August 16; 11533 Private J. W. Clover, 16107 Private W. Thomas, 15005 Private C. A. Jenkins, August 22; 11526 Private G. A. Wyld, August 5; 12391 Private J. W. Rawlings, July 29; 12488 Private W. C. Richards, July 11; 16070 Private E. Bareham, August 8.

Deaths.—14515 Private A. E. Styles, Mauritius, July 5; 15641 Private W. H. Brown, South Africa, July 20; 11119 Sergeant W. L. Glasgow, London, September 3; 18475 Private A. E. Gledhill, Malta, September 3; 10231 Private T. Ellis, Cork, August 23.

Arrivals from Abroad.—From Malta, August 22: 17786 Private T. Mellor, 16918 Private T. Dewhurst, 17409 Private H. Kimberly.

From South Africa, August 27: 8300 Staff-Sergeant J. W. Cook, 14706 Lance-Corporal J. Cairns, 12300 Private J. Lindsay, 14686 Private J. Pollard, 15300 Private J. McHugh (invalids); 5938 Sergeant-Major A. T. Green, 15534 Sergeant J. Edleston, 7631 Lance-Sergeant H. M. Butler, 11082 Lance-Sergeant J. Fraser, 11119 Lance-Sergeant W. L. Glasgow, 10087 Corporal E. Canterbury, 10884 Corporal G. Conboye, 10890 Corporal L. T. Fitzgerald, 11396 Corporal A. E. Pell, 10955 Corporal J. H. Rowe, 8696 Corporal B. W. W. Wason, 7805 Corporal A. J. Williams, 12146 Corporal W. J. Wilson, 12583 Lance-Corporal H. Ebbs, 12810 Lance-Corporal J. Grant; 15301 Private W. Arthur, 15076 Private R. Berry, 15232 Private R. T. Cotton, 15078 Private F. Cochrane, 15188 Private P. Connolly, 15299 Private C. Dyer, 15388 Private J. T. Dickson, 15386 Private C. Ellison, 15066 Private D. Fleming, 15615 Private W. Gelder, 15599 Private W. J. T. Harris, 15235 Private N. J. Hood, 15584 Private A. H. Jones, 15550 Private W. G. Little, 14018 Private P. A. Massey, 15478 Private J. McGrath, 15179 Private W. A. Musson, 12206 Private H. D. Palmer, 15441 Private J. Richardson, 15305 Private R. T. Sandy, 15392 Private J. Slater, 15306 Private J. W. Spalton, 15084 Private J. W. Sunter, 15590 Private N. Tarrant, 15587 Private W. E. D. Wemm, 15909 Private N. Holliday, 15839 Private A. Foster.

QUEEN ALEXANDRA'S IMPERIAL MILITARY NURSING SERVICE:—

Appointments.—To be Staff-Nurses.—Miss G. M. Allen, Miss K. M. Bulman, Miss M. E. M. Grierson, posted to Portsmouth; Miss L. M. Dann, Miss A. M. M. Denny, Miss E. M. Fairchild, Miss E. Foster, Miss O. M. Griffin, Miss E. M. Lyde, Miss A. M. MacCormac, posted to Netley; Miss A. M. Orchard, Miss M. S. Ram, Miss M. F. Steele, posted to Woolwich.

NOTES FROM SIERRA LEONE.—Major F. Smith writes: "Lieutenant Stanley has gone home on termination of tour. He has taken with him as a 'dash' to the Dublin Zoo a chimpanzee, which bids fair to rival the late 'Consul.' A few hours in the company of the young bush lady would cause the most sceptical to believe in evolution.

"The rains are now full upon us. Most of the ladies have fled to more enjoyable climes, and things generally are pretty dull. Some of us, however, prefer the rainy season, owing to its coolness. There are occasional fine days, and a daily constitutional is almost always possible, even in August. Much of our annual 160 or so inches comes in gushes of 4 or 5 inches during the night.

"Old 'Sierra Leonians' will be interested to hear that the Colonial Nursing Home, where sick officers are cared for, has been deprived of its head sister, owing to the lady having married. Mrs. Taylor of the Corps (a qualified doctor) has taken charge of the institution, pending the arrival of another nursing sister.

"Staff-Sergeant Barber is staying on the coast, beyond the usual twelve months, at his own request.

"The interesting 'Echoes from the past' in the JOURNAL remind me of the following notes in my scrap-book from a charming book by an old army doctor (Walter Henry). The first shows the *antiquity of the typhoid oyster*, and runs thus: 'About this time the surgeon of the regiment, having inadvertently indulged in a supper of some doubtful oysters, was attacked with indigestion, which was followed by a bad fever that cost the poor fellow his life, notwithstanding the assistance of the physician-general and another physician. The writer succeeded to the surgeoncy of the regiment.' This occurrence was at Richmond Barracks, Dublin, in 1825. There is amusing irony in the reference to the physician-general.

"Origin of the Black Plume."

"Regarding his outfit on appointment he writes; 'Next day I went to an army tailor to order my uniform. The *awful black feather* in my cocked hat was calculated to raise unpleasant ideas, and I considered it scarcely fair for the Horse Guards people to put me in mourning prematurely and by anticipation for any accidents among my patients. I recollect that I was interrogated afterwards in Silver Street in Lisbon by General P—o—ke about this identical black feather. It was very long and pliant, and on a wet or windy day used to whisk about my eyes, so that under these circumstances I always doubled it up into the fold of the crown of the hat to keep it out of the way. In this state the General met and accosted me: 'You are a medical officer, sir?' 'I am, sir.' 'Then where is your black feather, sir?' 'There it is,' I replied, flapping it across his nose. The General rode on. The staff surgeon of those days must have presented a grotesque appearance.

"Cause of Napoleon's Death."

"Henry also knew a good deal about the last days of Napoleon. He describes the *post mortem* on that monarch, and says that 'cancer of the pylorus' was the cause of death. He explains why, through French influence, the disease was not returned as cancer."

NOTES FROM PUNJAB COMMAND.—Captain W. R. P. Goodwin writes:—

"*Postings.*—On arrival in India Captain H. E. M. Douglas, V.C., D.S.O., has been posted to Rawalpindi.

"*Examinations.*—Extract from India Army Orders, dated May 16, 1904:—

"*341 Examinations—Promotions.*—At the examination held in India on March 1, 1904, and following days, the undermentioned officers passed or completed their examinations in the subjects mentioned against their names:—

"Major C. C. Reilly, R.A.M.C.; Lieutenant H. Rogers, R.A.M.C.; Lieutenant A. McMunn, R.A.M.C.; Lieutenant P. Davidson, R.A.M.C.; Lieutenant T. F. Ritchie, R.A.M.C.; Lieutenant H. G. S. Webb, R.A.M.C. (Passed in Military Law)."

NOTES FROM SALISBURY.—Lieutenant-Colonel G. Coutts writes (in continuation of notes published last month):—

"Royal Army Medical Corps, Camp of Instruction, Bulford. The 3rd Class, consisting of the following Officers, Warrant Officers, N.C.O.s, and men joined at Bulford on July 30.

¹ Distinguished in Military Law.

"*South Eastern District.*—Major W. H. Pinches; Quarter-Master-Sergeant F. Thurgate; Staff-Sergeant G. Scott; Sergeant J. H. Stacey; Lance-Sergeant P. Darrock; Corporals H. Bradley and H. G. Pitt, and 18 Privates.

"*Southern District.*—Major R. W. Wright; Lieutenant and Quarter-master J. Ferguson; Sergeant-Major H. Greenham; Staff-Sergeant J. M. Mason; Sergeants W. Clegg and A. Gibbs; Corporals E. G. J. Brice and E. J. Webberley; Lance-Corporal J. Plant and 17 Privates.

"*Western District.*—Sergeant-Major A. R. Rees; Corporal A. E. Cox; Lance-Corporal M. Stroud and 15 Privates.

"*Netley.*—Captain N. Marder; Lieutenant J. S. Dudding; Lieutenant M. C. Wetherell; Sergeants W. E. Maitland, F. E. Miles and J. W. Willsher; Corporals E. B. Buttell, E. J. Rogerson, A. Vale and J. Antill and 20 privates.

"The Camp of Instruction was inspected by Field Marshal H.R.H. the Duke of Connaught, K.G., K.T., K.P., G.C.B., &c., the Inspector General of the Forces, on Wednesday morning the 3rd inst.

"H.R.H., who was accompanied by Field Marshal Sir Evelyn Wood, V.C., G.C.B., &c., Commanding 2nd Army Corps, and a considerable Staff, was conducted round the Camp by Surgeon-General J. A. Clery, C.B., P.M.O., of the 2nd Army Corps, Colonel W. Donovan, C.B., P.M.O., Salisbury Plain District, and the Commandant of the Camp, Lieutenant-Colonel C. R. Tyrrell, R.A.M.C.

"Much interest was manifested in the work of the class, which was, at the time, under instruction (in sections) in the use of the various articles of Field, Hospital, and Bearer Company Equipment.

"His Royal Highness appeared to be well satisfied with the condition of the Camp generally, and after making a few terse inquiries into the method of training, concluded his inspection.

"The 3rd class concluded on the 12th instant.

"The 4th and final class, consisting of the following details, assembled at Bulford on the 13th instant:—

"*South Eastern District.*—Major W. H. Starr; Major W. E. Hardy; Sergeant-Major A. J. Wiseman; Quarter-Master-Sergeant F. Clark; Lance-Corporal A. J. Harper and 13 privates.

"*Southern District.*—Major J. R. Mallins; Captain A. H. Waring; Staff-Sergeant J. Carroll; Sergeant C. Elliott; Lance-Sergeant C. Witherow; Corporals J. T. Brewer, R. E. Leahy and 17 privates.

"*Western District.*—Major V. H. W. Davoren; Sergeant-Major G. J. Tothill; Lance-Sergeant J. Humble; Lance-Corporal A. E. Saunders and 15 privates.

"*Netley.*—Staff-Sergeant J. H. Curtayne; Sergeants F. Bird and J. Speers; Corporals S. Brooks, F. W. Cudmore and W. Robinson; Lance-Corporals J. Grogan, F. Loveland, P. E. Wagstaff, and W. Blundell, and 20 privates.

"*Salisbury Plain District.*—Lieutenant J. E. Skey.

"On the conclusion of this class on the 26th instant the Camp will be broken up and the equipment returned to store."

NOTES FROM PESHAWAR.—Lieutenant-Colonel M. W. Kerin writes:—

"*Peshawar Medical Society.*—The sixth meeting of the Society was held at the Section Hospital on Monday, July 11, Lieutenant-Colonel Dennys, I.M.S., being in the chair. The Minutes of the preceding meeting were read and confirmed. The subsequent course of some of the cases then shown was described.

"Notes on a case of cryptophthalmos under the care of Dr. Somerton Clarke, of Dera Ismail Khan, were read in his absence by the Hon. Secretary.

"Dr. Lankester, of Peshawar, showed a series of three calculi which had been encysted, one in the neck of the bladder, and two in the membranous urethra, and which had been accurately moulded to the shape of the surrounding structures. He also showed a case of tumour of the palate of one year's growth, occurring in a young man. Probably a non-malignant epulis.

"The following cases were shown by Lieutenant-Colonel Dennys, I.M.S.

"(1) Case of extensive tumour of sternum of two years' standing in a middle-aged man. Central part occupied by a foul ulcer, with evidences of softening above and below. No history of syphilis. Enlarged glands present. (Probably tertiary syphilis.)

"(2) Tumour of right testis and cord, with recent involvement of skin, in a boy aged 5 years, said to date from infancy. No ulceration, but extensive warty nodules on skin over tumour. (Opinions divided between sarcoma and tubercle.)

"(3) Case of slight real lengthening of lower limb without disease of hip, but in connection with a gluteal sinus communicating with lumbar caries, in a boy, aged 8 years.

"Captain J. Poe, R.A.M.C., showed a case of a soldier with acute pain in the region of the anus, apparently dependent upon disease of the coccyx. Since the meeting was held this case has undergone operation. A cheesy, half broken down mass about the size of a walnut was found near the tip of the coccyx, but there was no connection with the bone. There was also a fistula into the rectum high up, and two small sinuses through the connective tissue. The fistula was slit up from the opening into the rectum, and through the sphincter right back to the coccyx. The sinuses and cavity were scraped and the wound plugged. Since the operation all pain has ceased, and the case is doing well.

"The members then adjourned to the Station Hospital, when the following cases were shown by Lieutenant H. G. S. Webb, R.A.M.C., and discussed.

"(1) Case of paralysis of lower, and (to a less extent) of upper extremities, with absence of reflexes, but no impairment of power over sphincters. The history and symptoms seemed suggestive of hysteria, organic lesions being apparently negated by the distribution of the paralysis, and the absence of sensory affections. Patient was a highly neurotic man. Since the meeting the patient has made a complete recovery.

"(2) Case of injury of the knee by the pellet from a Morris's tube. The point of entrance was on the inner side of the knee, about one inch above level of joint, opposite the adductor tubercle. It apparently remained embedded in the soft tissues on the inner side of patella, but could not be localised owing to the 'concussion' synovitis present, which was, however, subsiding, and the case running an aseptic course.

"(3) Case of enteric fever, complicated with malaria after initial attack, with well marked rise after twenty-five days' subnormal temperature. Since the meeting of the Society this case has proved fatal. The *post mortem* showed several perforations in old ulcers; a few new ulcers were present, the result of the relapse. This case was interesting as showing the length of time which can elapse between the termination of a first attack and a true relapse.

NOTES FROM WOOLWICH.—Major T. P. Jones writes of the Woolwich Companies R.A.M.C. (Vols.): "The Annual Camp of these companies was held at Shorncliffe from July 30 to August 13. Strength, 13 officers, 402 N.C.O.s and men, 15 horses, and 7 waggons. Lieutenant-Colonel Stephenson, V.D., was in command, and the other officers present were Majors A. S. Greenway and T. P. Jones, R.A.M.C. (Adjutant); Captains M. A. Taylor, A. H. Minton, and J. Herdie; Lieutenants W. H. Payne, A. E. Jerman, and J. H. Naylor; Quarter-Masters and Honorary Lieutenants, J. P. Ekins, A. J. Naylor, W. T. Lomax, and A. J. Messent.

"The companies, with horses and waggons, after inspection by Major-General Leech, G.O.C., Woolwich District, left by troop train on the morning of July 30, except the cyclist company, which proceeded by road. The weather in camp was perfect, giving every facility for training.

"We were fortunate this year in being able to draw the medical and ordnance equipment of a fifty-bed Field Hospital, on service scale. This proved most valuable for instructional purposes, as by its means and aided by our own transport, thorough practice in the combined work of a Bearer Company and Field Hospital could be carried out.

"On August 2 the G.O.C. 4th Army Corps inspected the companies at their work.

"On August 5 the Annual Inspection was held by Colonel R. H. Quill, R.A.M.C., P.M.O., S.E. District, and in the afternoon of the same day the companies were inspected by H.R.H. the Inspector-General to the Forces.

"On August 18 the camp was broken up and the companies returned to Woolwich by troop train and road, as before.

"On August 27th a memorial brass, erected by their comrades to those members of the corps who fell in the South African War, was unveiled in the chapel of the Royal Herbert Hospital by General Lord Methuen, G.C.B. It should be noted that one officer and 135 N.C.O.'s and men of the corps took part in this campaign. Prior to the ceremony Lord Methuen inspected the companies on Woolwich Common. They then marched on to the R.H. Hospital and formed up in the square inside. The staircase and the chapel were also lined. On the unveiling of the memorial the

"Last Post" was sounded, the troops coming to attention and carrying swords. After the service in the chapel Lord Methuen addressed the corps and presented some South African medals."

NOTES FROM STANDERTON.—Major J. J. Gerrard writes:—"Lieutenant-Colonel F. A. B. Daly, C.B., R.A.M.C., still in command of the Hospital, Major J. J. Gerrard and Captain Adams-Williams have joined the station for duty lately, and civil surgeons O'Sullivan and Tough complete the staff.

"Captain Cato, R.A.M.C., arrived from Middelburg, Transvaal, with the 84th Battalion, R.F.A., and is in medical charge of the Brigade Division, which is in practice camp near here.

"The shooting this season is indifferent; game is scarce and the farmers not over friendly.

"The R.A.M.C. football team lost many of its useful members in drafts to England. The detachment has begun to devote its attention to Hockey with a certain amount of success. We have defeated the officers of the Royal Garrison Regiment by 6 goals to 1, and the Officer's Club Team 3 goals 1. Colonel Daly makes a most efficient goalkeeper. Major Gerrard also played. Corporal Newhouse as centre forward, and Lance-Corporal Pugh as centre half, are exceptionally good. The men play a particularly good and fast game, and we hope to have still more victories to report.

DEATH OF SURGEON-GENERAL J. JAMESON, LATE DIRECTOR-GENERAL, ARMY MEDICAL SERVICE.

We regret to record the death, on Tuesday, September 13, 1904, at Newlands, Eltham, of Surgeon-General James Jameson, M.D., C.B., K.H.S., late Director General Army Medical Service.

Surgeon-General Jameson was born at Kilburnie, Ayrshire, on August 15, 1837, and was therefore in the 68th year of his age. He was educated at Glasgow University and took his M.D. in 1865. He entered the Army as an assistant surgeon on November 9, 1857, and was gazetted to the 47th Foot, April 17, 1862. He was specially promoted to surgeon on May 18, 1870, in consideration of his highly meritorious service during the epidemic of yellow fever at Trinidad. He became Surgeon-Major on March 1, 1873, Brigade-Surgeon, May 2, 1883, Deputy Surgeon-General, September 14, 1888, Surgeon Major-General, July 6, 1893, and on the retirement of Sir William Mackinnon was appointed Director-General, May 7, 1896, which appointment he held until June 1, 1901.

Surgeon-General Jameson served with the English Ambulance during the Franco-German War, 1870-71, and received the Memorial Medal of Emperor William I. He was also awarded the Canadian General Service Medal with clasp for his service during the Fenian Raid in 1866. He was granted a Meritorious Service Reward in October, 1896, was made a C.B. in June, 1897, and appointed Honorary Surgeon to the Queen from October 29, 1897. He was also a Knight of Grace of the Order of St. John of Jerusalem.

He was a Doctor of Laws of the University of Glasgow, Doctor of Medicine (*honoris causa*) of the University of Dublin, and an Honorary Fellow of the Royal College of Surgeons, England, and of the Faculty of Physicians and Surgeons of Glasgow.

The above plain record of services and distinctions bear eloquent testimony to the many sided merits of the late Surgeon-General Jameson. Specially honoured by his Sovereign and by his old Alma Mater, the recipient of degrees and distinctions in the three Kingdoms of the Realm, he passes away full of honour at a time when all had hoped that a respite from the strenuous cares of his official life would have afforded him many years to enjoy the repose he had so well deserved. Somewhat below medium height, of sturdy build, he was endowed with more than average physical strength, and in his earlier days was renowned as a gymnast. Always fond of out-door sport he preserved his vigour to the end. It was on a fishing trip to Norway that he met with the accident which led to the illness causing his untimely death. He was keenly attached to his profession. Conspicuous professional devotion, during a severe epidemic

of yellow fever in Trinidad, in 1870, won him his first advancement, and this quality may be said to have been the key-note of his career. Throughout his life he spared no pains to keep himself abreast of professional advancement, and placed high value on the opportunities which occasional tours of service at home afforded him of intercourse with the profession at large, and of seeing and judging for himself new methods of practice and procedure. At heart he was an "army surgeon," and when a long period of peace denied him opportunities in his own service, he volunteered for work in the English Ambulance in the Franco-German War, throughout which he served.

Though always highly esteemed by those who had come in contact with him, his habitual reticence and modesty had made him less widely known than former Director-Generals, but the Service quickly recognised that it had in him a chief fully alive to its requirements, jealous to guard its interest and to advance its progress. It will never be forgotten that under Surgeon-General Jameson the Royal Army Medical Corps saw its birth, and the long-delayed aspirations of the Service came to fruition. During the trying time of the South African War, Surgeon-General Jameson's administrative capacity was taxed in a manner perhaps unprecedented in the annals of the British Medical Service, and how well he fulfilled his responsibilities is well known to the medical profession of Great Britain and Ireland, who marked their appreciation of his conduct and services by entertaining him at a special complimentary banquet on July 24, 1901, on the occasion of his retirement, after a total service of forty-four years. Year by year the esteem and affection in which Surgeon-General Jameson was held by the Royal Army Medical Corps increased, and the Corps now mourns the loss of one who watched over its birth, and whose interest in its welfare never ceased.

Surgeon-General Jameson was buried at Woolwich on September 17, 1904. The Royal Horse Artillery furnished a mounted detachment and firing party, while the Woolwich Company of the Royal Army Medical Corps was present in full strength. The funeral was very largely attended, amongst those present, in addition to the relatives, were the following Officers of the Army Medical Services at headquarters: Surgeon-General Keogh, C.B., D.D.G.; Lieutenant-Colonel Babbie, V.C., C.M.G., A.D.G.; Lieutenant-Colonel M. W. Russell, D.A.D.G.; Major H. Thurston, C.M.G., D.A.D.G.; and Lieutenant-Colonel Skinner. Sir W. Taylor was unable to be present owing to his absence in South Africa. Amongst others who attended were Colonel Rainsford, C.I.E., Principal Medical Officer, Woolwich and Thames District; Lieutenant-Colonels E. M. Wilson, C.B., C.M.G., D.S.O., Braddell, Hickman, and a numerous contingent of officers of the Corps from Chatham and Woolwich, General Russell, Surgeon-Generals Cuffe, C.B., Skey Muir, C.B., Mr. Sills, and many other old friends and comrades.

Surgeon-General Jameson leaves a widow, five sons and a daughter, to whom we offer our most sincere condolences. Two of his sons are Officers in the Royal Army Medical Corps, while a third is in the Medical Department of the Royal Navy, and will perpetuate the name of their father in the professional Service he loved and served so well.

BIRTHS.

MAHER.—At Camberley, on September 5, 1904, the wife of Major J. Maher, R.A.M.C., of a son.

GODDARD.—On August 21, at Naval Hill, Bloemfontein, O.R.C., the wife of Captain G. H. Goddard, R.A.M.C., of a son.

MARRIAGES.

TURNER—DENSHAM.—On the 18th inst., at St. Luke's Church, Grayshott, Surrey, by the Rev. Arthur Monde, M.A., Francis John Turner, R.A.M.C., son of the late Rev. H. J. Turner, to Mary Theodora, youngest daughter of Benjamin Densham, of Hindhead, Surrey.

USSHER—COMYN.—On August 18, at St. Paul's Church, Southsea, by the Rev. W. H. Bircham, M.A., Lieutenant Wm. A. Ussher, R.N.R., H.M.S. "Apollo," eldest son of the late James Ussher, Solicitor, Florence Villa, Lurgan, Ireland, to Sophie Honoria, only daughter of Surgeon-General J. S. Comyn, R.A.M.C. (Retired), of "Woodstock," Galway, and of 21, Ashburton Road, Southsea, and grand-daughter of Major-General Owen, R.A., of Camberley, Surrey.

DEATHS.

MENZIES.—On May 25, 1904, at Hospital Hill, Napier, New Zealand, Honorary Inspector-General Edward Menzies, retired pay, late Deputy Inspector-General of Hospitals, aged 84 years. He entered the Service October 29, 1841, was promoted Surgeon July 26, 1853; Surgeon-Major, October 29, 1861; and Deputy Inspector-General, March 4, 1868. He retired on August 17, 1870, with the honorary rank of Inspector-General.

HALE.—On the 6th inst., at Kirkee, Bombay, of enteric fever, Kathleen Lucy, the beloved wife of Major G. E. Hale, R.A.M.C., D.S.O., and youngest daughter of Dr. Frederick Wadd, of Richmond, Surrey.

HENSMAN.—On August 16, at Northdown, Margate, Ruby, second daughter of Lieutenant-Colonel William Hensman, R.A.M.C., of Cannesfield, Taunton, aged 26 years.

GREENWAY.—We regret to report the death of Major J. H. Greenway, R.A.M.C., which occurred at the Military Hospital, Wynberg, Cape Colony, on August 8, 1904. Major Greenway entered the Army as Surgeon on May 30, 1885. He was promoted to Major in May, 1897. Like many other officers of the Corps he spent most of his service abroad. He served some seven years in Cape Colony, where he was well known and universally popular. His only war service was during the early part of the late South African Campaign. He was present at the engagements of Belmont, Grasspan, Paardeberg. By the death of Major Greenway the Corps loses a most excellent officer. He was as good professionally as he was socially. His popularity with the Military, as well as Civil communities, was fully evidenced by the large attendance of both at his funeral, which took place with the usual Military Honours on August 11. Though with us but a short time we had all got to know and appreciate his true worth and sterling qualities. His loss was much regretted by all.

RIORDAN.—On September 9, at her husband's residence, Roseville, Clonmell, from cephalic tetanus, the result of a carriage accident, Gertrude, the dearly loved wife of Lieutenant-Colonel J. Riordan, R.A.M.C. (R.P.).—R. I. P.

ROYAL ARMY MEDICAL CORPS FUND.

The following subscriptions to the Compassionate Branch have been received for General Relief :—

From Lieutenant-Colonel C. R. Tyrrell, Commandant of the R.A.M.C. School of Instruction for 1904, on Salisbury Plain, as a donation from the Warrant and Non-commissioned Officers and men of the permanent staff and classes attending the school. (This sum was the profit made at the Canteen during the existence of the School)	£17 14 0
From the Military Hospital, Kroonstad (late No. 3 General Hospital), Canteen Fund, per Captain E. Bennett) ..	104 15 3
Total	<u>£122 9 3</u>

68, Victoria Street, W.
September, 1904.

B. SKINNER, *Lieutenant-Colonel,*
Honorary Secretary.

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OFFICERS are particularly requested to give timely notice of changes of station or changes of address, in order to ensure the posting of the JOURNAL to its correct destination.

The Editor will be glad to receive original communications upon professional subjects, travel, and personal experiences, &c. He will also be glad to receive items of news and information regarding matters of interest to the Corps from the various garrisons, districts and commands at home and abroad. All these communications should be written upon one side of the paper only, they should by preference be type-written, but, if not, all proper names should be written in capital letters (or printed) to avoid mistakes, and be addressed to the Editor, JOURNAL OF THE ROYAL ARMY MEDICAL CORPS, 68, Victoria Street, London, S.W.

Letters regarding subscriptions, non-delivery of the JOURNAL, or change of address, should be sent to Major T. McCulloch, R.A.M.C., 68, Victoria Street, London, S.W.

Communications have been received from Major A. R. Aldridge; Captains E. Blake-Knox, H. Bruce-Barnett, F. Y. Palmer Sweetman; Lieutenants J. M. McKenzie, F. C. Lambert; Lieutenant-Colonel W. Coates, R.A.M.C. (Vol.).

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The following periodicals have been received: *The Medical Record*, *The Medical News*, *New York Medical Journal*, *American Medicine*, *Gazette Med. de Paris*, *Archives de Medicine et de Pharmacie Militaires*, *Il Morgagni*, *Gazetta Medico-Italiana*, *The Medical Review*, *El Siglo Medico*, *Der Militärarzt*, *Deutsche Militärärztliche Zeitschrift*, *Anales de Sanidad Militar*, *Revue Med. de la Suisse Romande*, *La Medicina Militar Espanola*, *The Boston Medical and Surgical Journal*, *Annali di Med. Navale*, *Giornale del Regio Esercito*, *Le Caducée*, *The Hospital*, *The Ophthalmoscope*, *St. Thomas's Hospital Gazette*, *Bulletin de l'Acad. de Med. de Paris*, *Arch. Med. Belges*, *Voyenno Medisinskii*, *The Indian Medical Gazette*, *The Australasian Medical Gazette*, *Journal of the Association of Military Surgeons, U.S.*, *Militärlagen ungvet af Militärlägesforeningen, i Kjöbenhavn*, *The Veterinary Journal*, *The Practitioner*, *Public Health*, *Medical Review*, *Journal of Infectious Diseases*, *Chicago*, *The Army and Navy Gazette*, *The United Service Gazette*, *Journal of the Royal United Service Institution*, *The Johns Hopkins Press*.

We desire to remind members who paid their first year's subscription by cheque or postal order that the annual subscription is due on July 1, and it is very important that such should be promptly paid.

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The back outside cover is not available for advertisements.

NOTICE.

The Corps News is now printed as an inset to the Journal and separate copies may be subscribed for, price 2d. monthly.

JOURNAL

OF THE

ROYAL ARMY MEDICAL CORPS.

Corps News.

NOVEMBER, 1904.

ROYAL ARMY MEDICAL CORPS.

Lieutenant D. D. Paton, M.B., from the Seconded List to be Lieutenant, dated September 1, 1904.

Lieutenant-Colonel E. M. Wilson, C.B., C.M.G., D.S.O., retires on retired pay, dated September 23, 1904. He entered the Service July 30, 1881; was promoted Surgeon-Major July 30, 1893, and Lieutenant-Colonel July 30, 1901. He held the appointment of D.A.D.G., A.M.S., from October 2, 1899, to August 17, 1904. His war services are as follows: South African War, 1879. Zulu Campaign, as Civil Surgeon. Medal with clasp. Soudan Expedition, 1884-5. Nile. Medal with clasp; bronze star. Soudan, 1885-6. Frontier Field Force. Expedition up the Gambia against Native Chief Fodey Kabba, 1891-2. Ashanti Expedition, 1895-6. In command of Base Hospital. Honourably mentioned; C.M.G.; star. Nile Expedition, 1898. Battle of Khartoum. Despatches, *London Gazette*, September 30, 1898; D.S.O.; Egyptian medal with clasp; medal.

Lieutenant-Colonel H. E. Deane retires on retired pay, dated October 8, 1904. He entered the Service July 29, 1882; was promoted Surgeon-Major July 29, 1894, and Lieutenant-Colonel July 29, 1902. His war services are as follows: Operations on N.W. Frontier of India, 1897-8; with Tirah Expeditionary Force. Medal with two clasps.

Lieutenant-Colonel G. J. Coates, M.D. is placed on temporary half-pay on account of ill-health, dated September 26, 1904.

Captain H. W. Grattan, R.A.M.C., passed the D.P.H.Lond., July, 1904.

ROYAL ARMY MEDICAL CORPS (VOLUNTEERS).

The London Companies.—Henry Cadwalader Jones, Gent., to be Quartermaster, dated September 24, 1904.

The Glasgow Companies.—The undermentioned Lieutenants to be Captains: G. H. Edington, M.D., dated October 5, 1904; M. Dunning, M.B., dated October 5, 1904; S. M. Sloan, M.B., dated October 5, 1904; H. W. Thomson, M.B., dated October 5, 1904; A. Young, M.B., dated October 5, 1904; F. J. Charteris, M.B., dated October 5, 1904.

The London Companies.—The registration of Major T. H. Openshaw, M.B., F.R.C.S., C.M.G., which was announced in the *London Gazette* of September 2, 1904, is cancelled.

Devon Bearer Company.—Captain H. W. Webber, M.D., resigns his Commission, dated October 5, 1904.

Devon Bearer Company.—Alfred Bertram Soltan, M.D., to be Lieutenant, dated October 8, 1904.

VOLUNTEER CORPS.

3rd (Cambridgeshire) Volunteer Battalion the Suffolk Regiment.—Surgeon-Major J. P. Atkinson, M.D., to be Surgeon-Lieutenant-Colonel, dated September 17, 1904.

1st (Hertfordshire) Volunteer Battalion the Bedfordshire Regiment.—Cecil Frank Wightman, Gent., to be Surgeon-Lieutenant, dated September 17, 1904.

1st Volunteer Battalion the Gordon Highlanders.—The undermentioned Surgeon-Captains to be Surgeon-Majors: G. M. Edmond, M.D., dated September 17, 1904; G. Williamson, M.B., dated September 17, 1904.

ARMY MEDICAL RESERVE OF OFFICERS.

Surgeon-Lieutenant J. N. Macmullan, 1st Hertfordshire Rifle Volunteer Corps, to be Surgeon-Lieutenant, dated October 8, 1904.

THE VOLUNTEERS OFFICERS' DECORATION.

The King has been graciously pleased to confer the Volunteer Officers' Decoration upon the undermentioned Medical Officers of the Volunteer Force, who have been duly recommended for the same under the terms of the Royal Warrant dated July 25, 1892 :—

3rd Middlesex Royal Garrison Artillery.—Surgeon-Major Alfred Lingard.

4th Volunteer Battalion the Royal Fusiliers (City of London Regiment).—Brigade-Surgeon-Lieutenant-Colonel William Dakin Waterhouse.

2nd Devonshire Royal Garrison Artillery.—Surgeon-Lieutenant-Colonel Arthur Kyffin Crossfield (deceased).

5th (The Hay Tor) Volunteer Battalion the Devonshire Regiment.—Surgeon-Major Edgar Haydon, M.B.

1st Volunteer Battalion the King's (Shropshire Light Infantry).—Surgeon-Lieutenant-Colonel Frederick Knollys Pigott.

5th (Ardwick) Volunteer Battalion the Manchester Regiment.—Surgeon-Major John George Saville (retired).

1st Banff Royal Garrison Artillery (Volunteers).—Surgeon-Major William Lemmon Stewart, M.D. (retired).

8th Volunteer Battalion the Royal Scots (Lothian Regiment).—Surgeon-Major Robert Kirk, M.D.

4th (Nottinghamshire) Volunteer Battalion the Sherwood Foresters (Nottinghamshire and Derbyshire Regiment).—Brigade-Surgeon-Lieutenant-Colonel Frederick Henry Appleby.

ARRIVALS HOME.—From Sierra Leone: Captain T. J. Crean, V.C., and Lieutenant J. W. S. Seccombe. From Mauritius: Captain T. C. Mackenzie.

ARRIVALS HOME ON LEAVE.—Majors L. P. More, J. D. Ferguson, D.S.O., H. Bray, W. H. Horrocks, B. W. Longhurst; Captains H. G. F. Stallard, A. O. B. Wroughton; Lieutenant W. C. Rivers.

EMBARKATIONS.—For India: Lieutenant-Colonels G. Wilson, L. W. Swabey, F. J. Jencken; Majors H. B. Mathias, A. Y. Reily, S. G. Allen, C. T. Blackwell, B. J. Inniss, A. L. F. Bate, F. S. Le Quesne, V.C.; Captains F. Kiddle and M. Boyle; Lieutenants B. G. Patch, R. H. MacNicol, D. P. Watson, W. F. Ellis. For South Africa: Lieutenant-Colonel F. H. M. Burton; Majors B. Forde and N. C. Ferguson, C.M.G.; Lieutenants S. E. Lewis, T. S. Dudding, N. D'E. Harvey, F. C. Lambert, F. W. W. Dawson, O. Ievers, H. H. J. Fawcett, J. E. Skey. For Jamaica: Lieutenant-Colonel P. H. Johnston, C.M.G. For Egypt: Major J. F. Donegan and Captain C. K. Morgan. For Barbados: Lieutenant-Colonel H. C. Kirkpatrick; Major G. H. Barefoot; Captain J. P. Silver. To Mauritius: Major N. Manders and Captain H. E. Staddon. West Africa: Captain J. V. Forrest. Malta: Majors W. J. Trotter and R. F. E. Austin. Gibraltar: Major T. Du B. Whaithe.

EXCHANGES.—Colonel E. H. Fenn, C.I.E., exchanged with Colonel W. J. R. Rainsford, C.I.E., who will proceed to Bermuda.

POSTINGS.—Lieutenant-Colonel D. L. Irvine to Aldershot; Lieutenant Colonel R. L. Love to Ireland; Lieutenant-Colonel A. F. Russell to Colchester; Major E. McK. Williams to Home District; Major F. D. Elderton to Western District; Major G. S. Crawford to Aldershot; Lieutenants-Colonels G. T. Goggin, J. Gibson, Major H. T. Knaggs, and Captain F. S. Walker to Ireland. Captain A. E. Thorp to Southern District. Captain W. H. S. Nickerson, V.C., to Salisbury Plain District. Captain F. J. Palmer to Scottish District. Captain H. C. R. Hime to Netley; and Captain H. H. Norman to Woolwich.

CHANGES OF STATION.—Lieutenant-Colonel W. T. Johnson from Belfast to

Canterbury; Major F. W. H. D. Harris from Devonport to Bodmin; Major J. Kearney from Netley to North western District,

Colonel P. M. Ellis has been appointed Principal Medical Officer of the 7th Division, Irish Command.

ROYAL ARMY MEDICAL CORPS.

CASULTIES from September 11 to October 10, 1904 :—

Discharges.—4929 Sergeant-Major A. Down, in South Africa, August 31; 9842 Corporal S. E. Brooks, 1st period, September 20; 18249 Private T. Murphy, purchase, September 13; 12300 Private J. Lindsay, medically unfit, September 20; 17535 Private H. Sutcliffe, medically unfit, September 27; 14932 Private F. Nelson, purchase (South Africa), August 31; 16030 Private J. W. Kay, 1st period, October 10; 17750 Private W. Robinson, purchase, October 3; 18038 Private H. Bailey, medically unfit, September 9.

To Army Reserve.—10745 Sergeant S. Brown, in North China, July 13; 15724 Private C. H. Bush, September 15; 15673 Private H. M. Pendrey, September 15; 15300 Private J. McHugh, September 22; 14988 Private Percey, September 22; 16275 Private N. Leon, September 29; 16246 Private C. Jackson, September 25; 16333 Private D. Harte, September 9; 16284 Private J. Dyson, October 6.

Transfers to other Corps.—19144 Private S. Dyer, to A.S. Corps, September 15; 7479 Staff-Sergeant A. F. Owens to Aberdeen Company Royal Army Medical Corps (Volunteers), October 1.

Disembarkations.—From Egypt, s.s. "Rameses," September 21: 16210 Corporal W. Robinson, 16329 Private G. Cockrane, 18177 Private J. Plimer, 15919 Private R. Jones.

Embarkations.—To South Africa, per s.s. "Dunera," September 22: 6446 Sergeant-Major A. McNab, 6665 Sergeant-Major F. J. Bollen, 7634 Quartermaster-Sergeant S. Buckland, 7553 Quartermaster-Sergeant J. M. Rapson, 8083 Staff-Sergeant G. H. Roberts, 11039 Sergeant F. Richardson, 9839 Sergeant W. Chilverd, 11123 Sergeant H. J. Polhill, 10106 Sergeant E. Gooding, 11685 Sergeant W. E. Cox, 10721 Sergeant A. Smith, 14563 Corporal A. R. Lewis, 12174 Corporal S. Billot, 8124 Corporal A. Carter, 13892 Corporal H. Dixon, 11700 Lance-Corporal M. Stroud, 18662 Lance Corporal A. Hepburn, 11577 Lance-Corporal D. Russell, 16301 Lance-Corporal E. A. Lane, 18653 Private F. Flower, 17419 Private H. Thomas, 18936 Private F. Kidby, 18922 Private G. Cussell.

To Mauritius, per s.s. "Dunera," September 22: 10665 Sergeant H. J. Angell, 11410 Sergeant W. P. Conolly, 12623 Corporal H. S. Rolfe, 13666 Corporal W. C. Hughes, 16210 Private W. Allen, 17388 Private J. C. Church.

To Malta, per s.s. "Dilwara," September 24: 16115 Corporal E. B. Dewberry, 18448 Private G. W. Aldons, 18262 Private E. W. Clear, 17778 Private J. Magill, 19007 Private J. R. Dare, 18193 Private A. Nixon, 18258 Private H. Tempo, 17769 Private J. Evans, 14980 Private A. Bowden, 16931 Private W. Langtree, 19045 Private W. H. Chamberlain, 12629 Private W. Millar, 16001 Private S. McConaghy, 17053 Private D. Powell, 18652 Private T. Playle, 18032 Private J. J. Burns, 17153 Private A. Law, 18289 Private L. Tweed, 9921 Private J. J. Boud, 17965 Private J. J. Thompson.

To Egypt, per s.s. "Dilwara," September 24: 12365 Sergeant W. L. Brodie, 9861 Sergeant C. Malyon, 10766 Private D. Osborne, 17844 Private W. A. Clensham, 18395 Private C. A. J. Speller, 18362 Private E. Watts, 18379 Private A. White, 17434 Private S. J. Beasley, 12432 Private A. Ward, 18562 Private A. E. Coombes, 18513 Private A. Holland, 12496 Private J. McKay, 16997 Private W. H. Youlton.

QUEEN ALEXANDRA'S IMPERIAL MILITARY NURSING SERVICE :—

Appointments : To be Staff-Nurse: Miss N. Blew, posted to Portsmouth.

Resignations : The following Sisters have resigned their appointments on their marriage: Miss A. C. Jacob and Miss A. R. Rose-Innes.

Changes of Station :—

Matron: Miss A. Garriock, R.R.C., Alton to s.s. "Plassy," for Indian Transport duty.

Sister: Miss A. FitzGerald, Aldershot to s.s. "Plassy," for Indian Transport duty.

NOTES FROM MAURITIUS.—*Movements :* Captain T. C. Mackenzie, D.S.O., embarked for home on August 30 on six months' sick leave, after a severe attack of enteric fever. We wish him a quick recovery.

Various : The Brigadier-General commanding presented various N.C.O.'s and men with the South African medals, and Corporal T. Glennon with the Good Conduct medal, on the 14th inst. Captain G. E. F. Stammers, R.A.M.C., was in command of the

parade. Colonel E. North, S.M.O., accompanied the General, who afterwards inspected the hospital at Curepipe. Everything passed off satisfactorily.

The whole of the Corps in the Command (except four) are stationed at Curepipe, which is the only hospital for European troops, and consequently is the headquarters of the R.A.M.C., and is situated sixteen miles from Port Louis, the capital of the island.

Sports: The "Corps" in this Command is not very strong, but they are good sportsmen, and manage, in addition to their very arduous duties, to have a little sport at times. We have a fairly good Tennis Club, also a fairly good Football Team. Both last season and this we have entered a team in the Mauritius Military Football League. By-the-bye, the League was formed by the energy of a member of the "Corps," and its success has been greatly due to another member, Colonel E. North, Senior Medical Officer, who presented a very handsome challenge shield for competition; this, with medals, was won last season by a double company team of the 1st Northumberland Fusiliers. We in Mauritius cannot, of course, come up to Aldershot with their regimental teams in the league, but we do the next best, and, as this year, enter company teams. This season twelve teams have been competing, viz., eight from the British Infantry Regiment, two from the Royal Garrison Artillery, one Royal Engineers, and one from the "Corps."

Some of the teams can put up a very strong eleven, in fact they compare very favourably with many regimental teams I have seen even at Aldershot, that hotbed of soccer. But I am quite losing sight of the medico's team, which is the subject—or supposed subject—of my notes. With only about thirty men to pick from at the best of times, the team is often hard put to it to be able to get a team on the field; but they all put their shoulder to the wheel, and, willy-nilly, get a team somehow. Owing to their work they cannot at any time play away from home, so the other teams, understanding this, are always quite willing to play both matches on the home ground. On September 8, B Company 1st Northumberland Fusiliers visited Curepipe and played the "Corps." The result of the match was a draw of one goal each. Private Marshall had the honour of scoring the goal for the "Corps" in the first half of the game, the visitors equalising immediately afterwards. There was no score during the second half. The following comprised the R.A.M.C. team:—

Goal.—Private Keohane.

Backs.—Private Pheonix, Private Fielding.

Half-backs.—Private Soper, Lance-Sergeant Scott-Badcock, Private Cooper.

Forwards.—Corporal Hunt, Lance-Corporal Bullough, Private Marshall, Private Prior, Staff-Sergeant Thomas.

Linesman.—Corporal Tuohy.

The game was well contested throughout, the "Corps" having "hard lines" on many occasions, especially during the second moiety; but they could not increase their score, consequently had to remain satisfied with halving the points. For the home team Pheonix and Fielding played a good game; Badcock and Marshall also did well. Staff-Sergeant Thomas was lame, so could not do himself justice. On the whole it was a most enjoyable game, and the "Corps" are well satisfied with the result.

NOTES FROM ALDERSHOT.—Major McLoughlin writes: "The members of the Sergeants' Mess, Depôt R.A.M.C., held the Annual Rifle Competition on September 17. The scoring was distinctly good, considering the conditions under which the events were shot off. The following were the prize-winners:—

<i>Hammerton Cup.</i> (200, 500 and 600 yards. Seven shots at each distance. No sighters. Service sighting.)			<i>Magazine Independent.</i> (200 and 500 yards. Seven shots at each distance.)		
	Score.			Score.	
1st Staff-Sergt. Collier	91		1st Sergt. Colston	53	
2nd Q.M.-Sergt. Jackson	81		2nd Staff-Sergt. Collier	51	
3rd Staff-Sergt. Cox	80		3rd Sergt. Hasler	49	
<i>Lillywhite Cup.</i> (Conditions as above.)			<i>Best Score at each Distance.</i>		
1st Staff-Sergt. Collier	92		200 yards Staff-Sergt. Collier	31	
2nd Sergt. Hinton	84		500 „ Sergt. Hasler	33	
3rd Q.M.-Sergt. Jackson	84		600 „ Sergt. Hasler	32	
			<i>Aggregate Prize for Deliberate Practices.</i>		
			Staff-Sergt. Collier	183	

"The Annual Competition of the Depôt Rifle Club was held on September 2. The entries (except for the Officer's competition, which fell through) were fairly numerous and the shooting good on the average. The practices were carried out at 200, 500 and 600 yards' range, the Magazine and 'Young Soldier's' competitions at 200 and 500 yards only. 'Soldier-shooting,' i.e., through the notch only, was permitted. No

sighters. A 'tricky' wind prevailed through the day. The following were prize-winners in the various events :—

Warrant Officers and Sergeants.

	Score.	Prize.
Q.M.-Sergt. Jackson	79	20s
Sergt. Fletcher	77	15s
Sergt. Hinton	75	10s

Corporals.

Lance-Corpl. Chappell ..	64	20s
Lance-Corpl. Newton ..	62	10s
Corpl. Rondell	56	5s

Privates.

Pte. Pollington	68	20s
Pte. Papworth	60	15s
Pte. Burgess	50	10s

Challenge Shield.

Staff-Sergt. Collier	83	21s
Staff-Sergt. Cox	77	15s
(Major McLoughlin)	76	
Sergt. Hinton	76	12s 6d
Corpl. Rondell	74	7s 6d
Staff-Sergt. Gregg	73	5s

Magazine Independent (50 seconds).

	Score.	Prize.
Sergt. Hinton	52	17s 6d
Staff-Sergt. Collier	47	10s
Pte. Pollington	47	10s
Sergt. Ford	44	2s 6d
Sergt. Hasler	43	2s 6d
Sergt. Colston	42	2s 6d

Young Soldiers.

Pte. Floyd	50	17s 6d
Pte. Burton	45	12s 6d
Pte. Evans	40	10s
Pte. Kay	38	2s 6d
Pte. Austin	37	2s 6d

Best Score at each Distance.

200 yds. Staff-Sergt. Cox	31	5s
500 yds. Staff-Sergt. Collier	33	5s
600 yds. Sergt. Hinton	26	5s

Best Score at each Distance (Young

Soldiers only).

200 yds. Pte. Burton ..	29	2s 6d
500 yds. Pte. Lloyd ..	29	2s 6d

NOTES FROM CHATHAM.—*Cricket*: No. 10 Company concluded their fixtures on September 15, with the return match against No. 12 Company, Chatham being the victors by 55 runs. Scores: Chatham 102; Woolwich 47.

The club has had a very successful season, the principal victories being in the games played against the Army Service Corps, Army Pay Corps, Royal Marine Light Infantry, Sergeants 4th Rifle Brigade, and the premier local civil team, the Chatham Tradesmen.

Of the R.A.M.C. Inter-Company matches, honours are easy with Woolwich, the two fixtures arranged with No. 18 Company having been cancelled by the London team.

Kindly interest has been displayed for the Club's welfare by the Officer Commanding No. 10 Company, Lieutenant-Colonel E. A. Roche, R.A.M.C., and the Company Officer, Captain H. A. L. Howell, R.A.M.C.

The duties of Captain, Vice-Captain and Honorary Secretary have been ably performed by Quartermaster and Lieutenant T. J. Jacomb, Staff-Sergeant C. E. Delaney, and Staff-Sergeant W. Butler respectively. The following are the batting and bowling averages :—

Batting Averages.

No.	Rank and Name	Total No. of innings	Times not out	Most in an innings	Total runs	Average
1	Sergeant G. Taylor	1	0	31	31	31.00
2	Private E. Steele	3	0	30	56	18.66
3	„ E. Nicholas	22	1	65	252	12.00
4	Staff-Sergeant C. E. Delaney	19	2	60	203	11.94
5	Private W. C. Holden	3	1	14	21	10.50
6	„ J. Ellis	20	3	28	153	9.00
7	Sergeant F. C. Godbolt	3	0	21	26	8.66
8	Corporal S. Flint	17	1	27	108	6.75
9	Staff-Sergeant W. Butler	18	0	50	121	6.72
10	Private J. Morrison	11	3	15	48	6.00
11	Lieutenant T. J. Jacomb	18	1	15	98	5.78
12	Private I. Bloom	12	0	14	69	5.75
13	Staff-Sergeant H. Allwork	10	0	15	52	5.20
14	Private E. Franklin	7	3	7	21	5.20
15	„ R. G. Leggett	4	2	9	10	5.00
16	„ S. Elliot	4	2	9	10	5.00
17	„ E. Smith	16	3	10	50	3.84
18	„ I. Whittaker	5	0	9	17	3.40

Bowling Averages.

No.	Rank and Name	Wickets	Runs	Overs	Maidens	Average
1	Staff-Sergeant C. E. Delaney	77	374	167·5	35	4·50
2	Private E. Steele	9	46	26·00	7	5·11
3	Staff-Sergeant H. Allwork ..	4	22	6·4	4	5·50
4	Private S. Elliot	37	212	80·1	18	5·72
5	„ J. Morrison	27	163	49·3	5	6·03
6	„ E. Nicholas	10	65	23·1	5	6·50
7	Staff-Sergeant W. Butler ..	22	160	45·4	5	7·27

NOTES FROM THE WESTERN DISTRICT.—Colonel Bourke writes :—

“There are eleven officers of the Royal Army Medical Corps under orders for foreign service this coming trooping season.

“*For India*: Majors N. Manders, H. B. Mathias, D.S.O., H. E. Winter, G. A. T. Bray; Captain Kiddle, and Lieutenant D. P. Watson.

“*For South Africa*: Lieutenant-Colonel F. H. M. Burton and Major S. F. Clarke.

“*For Malta*: Major F. S. Le Quesne, V.C., and Captain A. E. Master.

“*For Barbados*: Captain J. P. Silver

“Major Le Quesne, V.C., has made an exchange and proceeds to India.

“Major Adamson who came home last trooping season has made an exchange and goes to India this winter.

“Lieutenant-Colonel Culling from South Africa has been appointed in charge of Station Hospital, Pembroke Dock, *vice* Lieutenant-Colonel Burton, proceeding to South Africa.”

NOTES FROM YORK.—Lieutenant Colonel J. B. Emerson writes :—

“*Cricket Club*.—No. 8 Company R.A.M.C. *v.* 18th (P.W.) Hussars. Played at York on July 30, resulting in a victory for the R.A.M.C. Scores: R.A.M.C. 206; 18th Hussars 78.

“The return match was played on August 26, resulting in a win by 2 runs for the R.A.M.C. Scores: R.A.M.C. 48; 18th Hussars 46.

“In the first match Corporal Newton gave a fine display of batting, scoring 53.

“*Football*.—The opening match of the season was played at York on September 10, *versus* No. 16th Company A.O. Corps, and after a well-contested game resulted in a draw.

“*Moves*.—Lieutenant-Colonel I. B. Emerson returned off leave and resumed charge of the Station Hospital, York, from Lieutenant-Colonel R. E. R. Morse, who afterwards assumed charge of Station Hospital, Newcastle-on-Tyne, in relief of Major P. C. H. Gordon, under orders for India.

“Major H. D. Rowan returned off leave August 17, and Captain F. J. C. Heffernan proceeded on leave on September 9.

“Sergeant-Major P. Crowley rejoined from R.A.M.C. School of Instruction, Bulford.

“No. 8270 Sergeant Jones joined at Newcastle-on-Tyne for duty.

“No. 11507 Sergeant Baxter joined from Aldershot for duty as Clerk to Medical Officer in Charge.

“Major J. J. O'Donnell proceeded to Leeds on August 21, to assume charge of Station Hospital there.”

Out of sixty applicants for the post of Dispenser and Secretaryship to the Macclesfield General Infirmary, at the salary of £100 a year, Quartermaster Sergeant M. E. Hanrahan was chosen. After serving 21 years in the Royal Army Medical Corps, he qualified as a compounder of medicine in 1895.

NOTES FROM SIERRA LEONE.—Major F. Smith writes : “Captain L. F. Smith has been posted to the Station Hospital, Mount Aureol, on arrival.

“Captain Bliss has gone up country to Mabanta in relief of Lieutenant Seccombe, who proposes to follow Major Pearce's example by taking two months' shooting leave before he goes home.

“Captain T. J. Crean, V.C., left for home on September 4, tour expired.

"The 'Simla' of West Africa is likely to be in the hills of Sierra Leone near Wilberforce. Twenty-three spacious bungalows are being erected for civil officials of the Government. Two are already completed and occupied, one by the Colonial Secretary and the other by the Chief Justice. The buildings are designed to accommodate married couples. We are filled with envy. A convenient mountain railway to the new hill station has been constructed and trains are now running regularly. The site of this official townlet was selected by Major Ronald Ross, F.R.S., with a view to the segregation of Europeans. It is amusing, therefore, to find that the Colonial authorities have already built a prison there, to be occupied by Negro prisoners who are to do work at the segregation town."

NOTES FROM STANDERTON.—Major Gerrard writes: "The local '6 aside' Football Competition was concluded yesterday, our team winning. Ten teams, military and civilian, entered. In the first round, R.A.M.C. defeated the R.E. by 4 points to *nil*. In the second we defeated the S.A.C. by 5 points to 1. The final lay between the 2nd Royal Garrison Regiment and ourselves, and was played off yesterday on the team ground: our team proved superior all through and won by 14 points to 1. The team is a particularly good one; the men play with great dash and with excellent combination and judgment."

"Team: Privates Hillen (Captain) Carrol, Johnson, Light, Lunney and Whiteley."

"We played a strong team of combined Officers of the Garrison lately at hockey. We won by 1 goal to *nil*, but were unfortunate not to have made a greater score, as we were pressing them most of the game. Sergeant Newhouse being able to play again as centre forward and Captain Addams-Williams on the wing, strengthened our team materially. Private Hillen and Corporal Pugh played a remarkably good game."

NOTES FROM SINGAPORE.—At a meeting of the Malaya Branch of the British Medical Association, held at Quala Sumpur, Federated Malay States, on July 3, 1904, Lieutenant-Colonel W. Dick, R.A.M.C., was elected Vice-President of the Singapore Division, and Major J. Ritchie, R.A.M.C., was elected Secretary of the Branch. At the first meeting held in Singapore after the election, Lieutenant-Colonel W. Dick, in the chair, a paper on "Appendicitis" was read by the Chairman, followed by a discussion.

NOTES FROM THE BARBADOS COMMAND.—Lieutenant-Colonel E. C. Milward, R.A.M.C., S.M.O., writes: "Lieutenant S. M. Adye-Curran, R.A.M.C., on return from three months' leave in the United Kingdom, on September 26, will be detailed for duty at St. Lucia."

"Major G. H. Barefoot, R.A.M.C., on four months' sick leave from St. Lucia, is staying at Contrexeville."

"Lieutenant-Colonel F. P. Nichols, R.A.M.C., after having spent eighteen months at St. Lucia, has been transferred to Barbados, and is now commanding the Station Hospital there."

"Lieutenants A. W. A. Irwin and S. M. Adye-Curran, R.A.M.C., attended the examination held at Barbados on May 30 last, in (h) Royal Army Medical Corps Subjects for promotion to Captain. The result of the examination has not yet been made known."

"It is reported on official authority that there is a prospect of the withdrawal of the detachment 4th Battalion Worcestershire Regiment to Barbados, from Trinidad, at a very early date."

"A Detachment School has been lately opened at the Station Hospital, Barbados, for the instruction of patients, under War Office authority. Quartermaster - Sergeant J. A. Sykes, R.A.M.C., is conducting the teaching."

NOTES FROM THE CURRAGH.—The following is the record of matches (Cricket), for the season 1904, played by No. 17 Company, R.A.M.C.

Special attention might be directed to the performances of the two bowlers, Sergeant-Major Bollen and Private Mayo, whose services were invaluable. In the second match, *versus* Newbridge Garrison, Sergeant-Major Bollen took all 10 wickets for 40 runs.

The departure of this Warrant Officer on foreign service will be much felt in all the outdoor sports of the Company. Not only in cricket, but at hockey and football his enthusiasm was infectious and produced the best results.

Record of Matches played.

Date	Opponents	No. of runs, R.A.M.C.	No. of runs, Opponents	Remarks
Apl. 30	Army Ordnance Corps	38	25	Won by 13 runs.
May 21	" " " " " " " " " " " "	261	35	" 226 " and 2 wickets.
" 30	4th Lancashire Fusiliers	167	61	" 106 " " 1 wicket.
June 4	Royal Engineers	146	112	" 34 "
" 8	4th Royal Warwicks	89	38	" 51 "
" 16	19th Hussars (<i>Curragh District Cup</i>)	106	60	" 46 "
" 18	8th King's Royal Rifles	130	43	" 87 "
" 27	Royal Engineers	124	40	" 84 "
July 13	Newbridge Garrison (R.H.A. & R.F.A.)	165	161	" 4 " " 3 wickets.
" 23	11th Hussars (<i>Curragh District Cup</i>)	78	125	Lost by 47 " " 6 "
Aug. 8	Newbridge Garrison (R.H.A. & R.F.A.)	99	77	Won by 22 "
" 22	4th Royal Warwicks	56	86	Lost by 30 "
Total ..		1,459	863	

Results : Won 10 ; lost 2 ; drawn 0.

Batting Averages.

Player	No. of innings completed	Total runs	Times not out	Highest score	Average
Private Aldous	11	230	1	77*	20·99
Lieutenant-Colonel Peterkin	9	183	—	56	20·33
Lieutenant MacNicol	13	211	—	41	16·23
Captain Martin	6	91	1	91	15·16
Lieutenant Fevers	7	97	2	29	13·85
Hon. Lieut. and Q.M. Short	5	65	—	24	13·0
Corporal Connor	12	149	2	28	12·41
Sergeant-Major Bollen	14	170	—	43	12·14
Major Dalton	6	68	—	25	11·33

* Signifies not out.

Bowling Averages.

Bowler	Overs	Maidens	Runs	Wickets	Average
Sergeant-Major Bollen	134	32	383	57	6·71
Private Mayo	123	35	306	41	7·46

No. 17 COMPANY R.A.M.C. SPORTS.

The annual sports of the above Company took place at the Curragh, on August 20, in fine weather, and were greatly enjoyed by the whole Company. Mrs. Peterkin kindly distributed the prizes. Details:—

	First Prize.	Second Prize.	Third Prize.
Long Jump	Pte. Bowman ..	Pte. Proctor ..	—
High Jump	Pte. Proctor ..	Pte. Edwards ..	Pte. Bowman.
Boys' Race	Fred Bollen ..	Wilfred Bollen ..	Bertie Servey.
Girls' Race	Alice Jordan ..	Gladys Bollen ..	Hilda Jason and Bertha Kelly.
Tug of War	Corpl. Pullen's Team	Corpl. Hiatt's Team	—
Veterans' Race	Sergt.-Major Bollen	Corpl. Hiatt ..	Pte. Parkinson.
Throwing the Cricket Ball	Pte. Carnaby ..	Pte. Mayo ..	Pte. Proctor.
Kicking the Football ..	Pte. Mayo ..	Pte. Parkinson ..	Pte. Mills.
Best Dressed Man ..	Ptes. Graham and H	orloo, equal.	—
100 yards Race	Pte. Proctor ..	Pte. Mayo ..	Pte. Bowman.
Sack Race	Pte. Sams ..	Pte. Johnson ..	Pte. Knight.
Thread-the-Needle Race	Miss Buckley ..	Mrs. Chapman ..	Mrs. Stone.
440 yards Race	Pte. Mayo ..	Pte. Bowman ..	Pte. Casey.
Boot Race	Pte. Sams ..	Pte. Barber ..	Pte. Bowden.
Potato Race	Ptes. Aldous and Bar	ber, dead heat.	—
Egg and Spoon Race ..	Pte. Hill ..	Sergt. Servey ..	—
Siamese Race	Ptes. Proctor and Mayo	Ptes. Carnaby and Hill	—
Consolation Race ..	Pte. Woods ..	—	—

LIST OF TOUR-EXPIRED OFFICERS OF THE ROYAL ARMY MEDICAL CORPS, DETAILED TO EMBARK FOR ENGLAND FROM INDIA IN THE SEVERAL TRANSPORTS, SEASON 1904-5.

1st Transport "Assaye," October 12, 1904.—Major G. D. Hunter, D.S.O., Bengal (in charge); Major A. Stables, Bombay; Major F. W. G. Hall, Punjab; Major H. I. Pocock, Bombay; Captain B. Watts, Punjab; Captain W. P. Gwynn, Madras; Captain J. Matthews, Bombay.

2nd Transport "Soudan," October 21, 1904.—Lieutenant-Colonel H. O. Trevor, Burma (in charge); Major J. H. Brannigan, Punjab; Major E. S. Marder, Madras; Major G. T. Rawnsley, Punjab; Captain S. A. Archer, Bengal; Captain J. Poe, Punjab; Captain J. Cowan, Madras.

3rd Transport "Plassy," November 2, 1904.—Lieutenant-Colonel W. G. Birrell, Bombay (in charge); Major T. H. Corkery, Bombay; Major J. Thomson, Madras; Captain P. McKessack, Punjab; Captain H. L. W. Norrington, Bengal; Captain G. M. Goldsmith, Bengal; Captain P. H. Falkner, Madras.

4th Transport "Sicilia," November 11, 1904.—Lieutenant-Colonel J. G. Harwood, Bombay (in charge); Major B. F. Zimmermann, Punjab; Major R. J. D. Hall, Bombay (joins at Aden); Captain N. H. Ross, Bombay (joins at Aden); Captain A. Chopping, Punjab; Captain J. J. W. Prescott, D.S.O., Madras; Captain J. W. Langstaff, Bombay (joins at Aden).

5th Transport "Assaye," December 15, 1904.—Lieutenant-Colonel H. S. McGill, Bombay (in charge); Major J. R. Forrest, Bombay; Major J. S. Davidson, Burma; Captain C. W. Mainprise, Bengal; Captain E. E. Ellery, Bombay.

6th Transport "Soudan," December 27, 1904.—Lieutenant-Colonel R. H. Forman, Madras (in charge); Major T. B. Beach, Bengal; Major C. A. Stone, Bombay; Captain W. R. Blackwell, Bengal; Captain H. S. Anderson, Burma.

7th Transport "Plassy," January 6, 1905.—Lieutenant-Colonel E. Butt, Punjab (in charge); Major W. E. Berryman, Bengal; Major J. M. F. Shine, Madras; Captain E. P. Connolly, Bengal; Captain M. H. Babington, Madras; Captain H. S. Koch, Bengal.

8th Transport "Sicilia," January 17, 1905.—Lieutenant-Colonel G. F. Gubbin, (in charge); Major R. J. Copeland, Bengal; Major C. W. R. Healey, Burma; Captain M. M. Lowsley, Bombay; Captain F. G. Richards, Bombay.

9th Transport "Assaye," February 11, 1905.—Lieutenant-Colonel A. H. Burlton, Bengal (in charge); Major E. G. Browne, Punjab; Major J. C. Connor, Punjab; Captain F. S. Irvine, Bengal.

10th Transport "Soudan," March 1, 1905.—Lieutenant-Colonel W. J. Baker, Bengal (in charge); Major E. M. Morphew, Madras; Major J. D. Alexander, Bengal; Captain H. M. Morton, Madras.

11th Transport "*Plassy*," March 14, 1905.—Lieutenant-Colonel T. B. Winter, Bombay (in charge); Major A. T. I. Lilly, Bombay; Major J. H. Curtis, Bombay; Captain H. O. B. Browne-Mason, Punjab; Captain O. W. A. Elsner, Punjab; Captain J. H. R. Bond, Bombay; Captain E. W. Siberry, Punjab.

12th Transport "*Sicilia*," March 22, 1905.—Lieutenant-Colonel F. J. Lambkin, Bombay (in charge); Major S. E. Duncan, Bengal; Major J. M. F. Kelly, Punjab; Captain G. G. Delap, D.S.O., Bombay; Captain B. F. Wingate, Bengal.

BATCH DINNER.

THE members of the July 1881 batch dined together at the Café Monico on October 12. The following officers were present: Lieutenant-Colonels W. Babbie, V.C., A. M. Davies, H. W. Hubbard, S. C. Culling, N. F. O'Brien, C. W. Thiele, G. T. Truman, E. M. Wilson, J. McLaughlin, and Major S. H. Creagh.

Letters of regret were received from nearly all the absent members, both at home and abroad, and it was agreed to continue the dinner annually, as a pleasant way of meeting old friends, and to notify the fact in the JOURNAL in case other batches might wish to follow suit.

It is proposed to meet next year on the third Wednesday in October, and it is hoped that all members will note the date and attend if possible. A reminder will be sent in the course of next year.

BIRTHS.

ADAMSON.—On the 7th inst., at Bodmin, the wife of Major H. M. Adamson, R.A.M.C., of a son.

CAMERON.—On October 4, at Colchester, the wife of Sergeant Thomas Duncan Cameron, Royal Army Medical Corps, of a daughter.

PINCHES.—On October 1, at 20, Margaret Street, Cavendish Square, the wife of Major W. H. Pinches, R.A.M.C., of a daughter.

MARRIAGES.

KEARNEY—MCDONNELL.—On the 11th inst., at Cork, by the Rev. R. McCarthy, Administrator, Cathedral, Major John Kearney, R.A.M.C., Netley, to Katherine, elder daughter of John McDonnell, Sunday's Well, Cork.

KEMPTHORNE—MACKARNESS.—At St. Michael's Church, Sandhurst, on the 20th ult., the wedding took place of Mr. Gerard Ainslie Kempthorne, R.A.M.C., son of the Rev. P. H. Kempthorne, of Rivington, Wick, Gloucestershire, and Miss Kathleen Mary Mackarness, daughter of the late Mr. G. Evelyn Mackarness, of Lahard, co. Cavan, and grand-daughter of the late Bishop Mackarness, of Argyll, and the Isles.

INKSON—BROMLEY.—On August 3, at St. Bartholomew's, Sydenham, by the Rev. W. Bromley, uncle of the bride, assisted by the Rev. Canon Moberly, Vicar of the Parish, Captain E. T. Inkson, V.C., R.A.M.C., son of the late Surgeon-General Inkson and Mrs. Inkson, of Eastbourne, to Ethel Maud, eldest daughter of Henry Bromley, Esq., Tower House, Sydenham.

STOCK—VAN BEEK.—On September 20, at St. Peter's Cathedral, Pietermaritzburg, Natal, by the Rev. M. de Boinville, Philip Graham Stock, R.A.M.C., Assistant Medical Officer of Health, Johannesburg, youngest son of Granger Stock, Esq., Clifton, Bristol, to Ellen Elizabeth (Nellie), eldest daughter of Carl Van Beek, Esq., Johannesburg. (No cards.)

DEATHS.

ASHTON.—On September 19, at Marlborough Lawn, North Devon, Brigade-Surgeon William Ashton, M.B., late Army Medical Department, retired pay, aged 69 years. He entered the Service, September 15, 1857; was promoted Surgeon, March 27, 1872; Surgeon-Major, March 1, 1873; and Brigade-Surgeon, October 5, 1882. He retired December 29, 1888. His war services are as follows: Indian Mutiny, 1857-9. Capture of Rampore Kussia, passage of the Gogra at Fyzabad, action of Toolsepoore, and minor affairs. Medal.

- BEATH.—On September 3, at Stirling, Honorary Deputy-Surgeon-General John Henry Beath, M.D., C.B., retired pay, aged 69 years. He entered the Service September 15, 1857; was promoted Surgeon, February 24, 1872; Surgeon-Major, March 1, 1873; Brigade-Surgeon, September 27, 1882. He retired December 9, 1882, with the honorary rank of Deputy-Surgeon-General. His war services are as follows: Indian Mutiny, 1857-9. Siege and capture of Lucknow. China War, 1860. Action of Sinho, taking of Tanku and Taku forts. Medal with clasp. Egyptian Expedition, 1882. Despatches, *London Gazette*, November 17, 1882. Medal; bronze star; 3rd Class Order of the Medjidie; C.B.
- BOLSTER.—On September 19, at Mallow, co. Cork, Major James McMullen Bolster, F.R.C.S.I., R.A.M.C., retired pay, aged 50 years. He entered the Service, March 6, 1880, and was promoted Surgeon-Major, March 6, 1892. He was placed on temporary half-pay on account of ill-health, March 4, 1898, and restored to full pay, May 22, 1900. He retired December 21, 1901.
- PHIPPS.—On August 25, at Strassburg, Captain George Constantine Phipps, late R.A.M.C., retired pay, aged 30 years. He entered the Service January 28, 1899, and was promoted Captain, January 28, 1902. He was placed on temporary half-pay on account of ill health, July 6, 1902, and retired on retired pay, November 5, 1902. He served in the South African War, 1899-1900. Queen's medal with clasp.
- RANDELL.—On the 13th inst., at "Goodwood," Beckenham, Katharina Alice, widow of the late Surgeon-Major Henry Lloyd Randell, Army Medical Staff, P.M.O., Straits Settlements, aged 63 years.
- RYAN.—On October 7, at Ryde, Isle of Wight, Lieutenant-Colonel George Ryan, late R.A.M.C., aged 59.
- WILSON.—On September 27, very suddenly, at The Bower, Bray, Berks, Hon. Brigade-Surgeon Edwin Wilson, retired, Medical Department, aged 76. Deeply regretted.

THE ENNO SANDER PRIZE.

INFORMATION has reached us that this prize of the Association of Military Surgeons of the United States, which consists of a gold medal of the value of 100 dollars, has been awarded to a retired officer of the Corps, Lieutenant-Colonel W. H. Climo, for the best essay on "The Relation of the Medical Department to the Health of Armies." We congratulate Lieutenant-Colonel Climo on his success. This is the second year in succession that this prize has been gained by an officer of the British Army Medical Service, the prize having been gained last year by Major F. Smith, D.S.O.

THE FRIENDLY SOCIETY OF THE OFFICERS OF THE MEDICAL DEPARTMENT OF THE ARMY.

WITH reference to the Report of the State of the Friendly Society which appeared in the September number, the following figures are of interest:—

The total amount of all monies belonging to the Society on

December 31, 1873 was	..	..	..	..	£79,561	13	2
" 1883 "	..	..	..	..	85,648	17	10
" 1893 "	..	..	..	..	100,228	18	2
" 1903 "	..	..	..	..	123,115	17	11

COLONEL T. LIGERTWOOD,
Secretary.

THE ROYAL ARMY MEDICAL CORPS FUND.

THE FOURTEENTH MEETING OF THE COMMITTEE.

THE Fourteenth Meeting of the Committee was held at 68, Victoria Street, S.W., on Tuesday, October 18, 1904, at 4 p.m.

Present: Surgeon-General W. H. McNamara, C.B., C.M.G., in the Chair; Surgeon-General A. H. Keogh, C.B.; Colonel A. T. Sloggett, C.M.G.; Lieutenant-Colonel R. H. Firth; Major H. C. Thurston, C.M.G.; Captain G. St. C. Thom; Major and Quartermaster G. Merritt.

(1) The Minutes of the Thirteenth Meeting were confirmed.

(2) Major Thurston, C.M.G., Staff Officer to the Director-General, took his seat as *ex-officio* member of the Committee, in place of Lieutenant-Colonel Wilson, C.B., C.M.G., D.S.O., who has vacated the post of Deputy Assistant Director-General.

(3) *The de Chaumont Prize Trust*.—With reference to Minutes 11a of the Ninth Meeting and 2b of the Twelfth Meeting, it has been found impracticable to invest the Prize Trust in the East Indian Railway Company 3 per cent. Debenture Stock, as that Company does not issue stock certificates to bearer, and thus the wish of the Committee that transfers of the stock should not be obligatory when one of the trustees vacates his office would have been impossible of execution. The debenture stock in the above and other companies would have to be transferred whenever the Director-General or the Commandant were changed, and considerable expense would then be entailed.

Taking these facts into consideration, the purchase was made of £200 Indian Government 3 per cent. Stock, the cost of which, including brokerage, was £190 5s. The certificates of this Stock will be held by Messrs. Holt and Company, to the order of the Director-General and Commandant, and subsequent transfers will not be necessary.

The Committee unanimously approved of the action taken.

(4) The accounts for the quarter ended September 30, 1904, presented by the Aldershot Sub-Committee, were considered and approved. They are appended to these Minutes, together with a statement of those receiving relief.

(a) It was noted that the Widows' and Orphans' Fund has decided to make an annual subscription of one guinea to the Soldiers' Daughters' Home, Hampstead, London.

(b) *General Relief Fund*.—As this Fund has £42 17s. 8d. in hand, it was agreed that it was not necessary to make any grant until the amount had been expended. Should that occur before the next accounts are presented the Hon. Secretary was authorised to meet any demand, up to £20 (twenty pounds), which might be considered necessary by the Aldershot Sub-Committee.

(c) *The Band Fund*.—The sum of £50 (fifty pounds) was voted to the Band Fund to meet current expenses during the present quarter.

(5) The following sums have been received for the Compassionate Branch (General Relief) since the last meeting of the Committee: Military Hospital, Kroonstad, from Canteen Fund, £104 15s. 3d.; Lieutenant-Colonel Tyrrell, on behalf of R.A.M.C. School of Instruction at Salisbury Plain, out of Canteen Fund, £17 14s.; Lieutenant-Colonel W. A. Morris, £2.

The following sums have been expended from the Charitable Schools Fund: For H—'s children, outfit and travelling, £2 10s.

(6) In addition to the sum of £190 5s. expended on the de Chaumont Prize Trust, the following sums have been expended from the Memorial Branch: Artist for two pictures and expenses in connection therewith, £33 5s.; Forrest Memorial, £5 10s. 6d.

(7) There being a balance in hand of £4 17s. 2d. from the Forrest Memorial Fund, it was decided that Mrs. Forrest should be consulted as to its disposal, and that she should be asked whether she would wish that sum devoted to a further memorial to Captain Forrest, or whether it should be placed to the credit of the General Relief Fund, or to the credit of the Fund for Memorials to Distinguished Officers.

(8) As the Fund now deals with a considerable sum of money, the Hon. Secretary asks that auditors may be appointed to examine the accounts for 1904, which will be ready early in January next. The Committee therefore appointed the following officers who consented to act as auditors for this year's accounts: Colonel Sloggett, C.M.G., and Lieutenant-Colonel Firth.

(9) At the Second General Meeting the Director-General made some observations on the neglected condition of the Benevolent Fund, whereupon Colonel Trevor proposed that the R.A.M.C. Fund Committee should consider the possibility of coming to the assistance of the Benevolent Fund, and should report thereon at the next General Meeting of the R.A.M.C. Fund. Surgeon-General Cuffe, one of the auditors of the Benevolent Fund, pointed out that that Fund was not in a position to deal with all the cases of distress brought before it, and it was possible that the R.A.M.C. Fund might be able to put new life into that Fund. Lieutenant-Colonel Trevor's proposal, seconded by Lieutenant-Colonel Babbie, V.C., was carried unanimously.

The Committee now considered what steps should be taken to give effect to the above resolution, and agreed that the Committee of the Benevolent Fund should be invited to confer with a Sub-Committee of the R.A.M.C. Fund with a view to ascertaining precisely how the question stands, and, if necessary, considering what sugges-

tions it might be advisable to lay before the Corps at the next General Meeting of the R.A.M.C. Fund. The following officers consented to act as a Sub-Committee for this purpose: Surgeon-General Keogh, Colonel Sloggett, and Lieutenant-Colonel Firth.

(10) It was notified that boy R.— was admitted into St. Vincent's Orphanage on August 15 last.

(11) A letter and advertisement addressed to the P.M.O., Netley, by Mrs. Charles Southerden, Jury's Gap, near Rye, Sussex, was submitted to the Committee for consideration, the purport being the formation by Mrs. Southerden of a home for pensioners.

The Committee unanimously agreed that it is not prepared to support an undertaking of this description.

October 20, 1904.

B. SKINNER, *Lieutenant-Colonel,*
Hon. Secretary.

The following have received relief from the Fund during the quarter ended September 30, 1904.

FROM THE GENERAL RELIEF FUND.

Mr. F. A. L., Havant. Late No. 10001 Private M.S.C., receives £2 monthly, which was continued from last quarter.

Mrs. M. B., London. Wife of 18153 Private R.A.M.C., receives £2 monthly, which was continued from last quarter.

Mr. E. W., Failsworth, Lancs. Late 9350 Private R.A.M.C., receives £1 10s. monthly, which was continued from last quarter.

Mrs. S., Dublin. Wife of 16159 Private R.A.M.C., receives £2 monthly, which was continued from last quarter.

Mr. F. P., Ash, Surrey. Late No. 10947 Private R.A.M.C. Invalided in 1901. Is married and has two children. Receives a Government pension of 1s. 6d. a day, and is too ill to work. Has received £2 monthly this quarter, which is being continued.

Mrs. G., Worthing. Wife of No. 18286 Private R.A.M.C. Husband since invalided with tubercle of lung. Has five children. Has received £2 monthly this quarter, which is being continued.

Child S., Aldershot. Child of 15819 Sergeant Smith, serving at the Dépôt. Thirteen shillings paid for maintenance of child in a Convalescent Home at Southsea for a fortnight.

FROM THE WIDOWS' AND ORPHANS' FUND.

Mrs. B., London. Wife of Sergeant-Major, who committed suicide. Was granted £2 to help the cost of the funeral being paid.

Mrs. C., Chester. Widow of 9938 Private R.A.M.C., receives £1 5s. monthly. Age 33.

Mrs. S., Netley. Widow of a pensioner, receives £2 monthly. Age 56.

Mrs. H., Chester. Widow of 15532 Corporal R.A.M.C. Received £2 monthly. Age 44. From August inclusive the amount was reduced to £1 5s. monthly, two of her children having been placed in a school.

Mrs. S., London. Widow of a pensioner, receives £1 10s. monthly. Age 58.

Mrs. W., Colchester. Widow of 15976 Private R.A.M.C., receives £1 monthly. Age 50.

Mrs. S., London. Widow of 6049 1st Class Staff-Sergeant R.A.M.C., receives £1 monthly. Age 41.

Mrs. K., London. Widow of a pensioner, receives £1 10s. monthly. Age 64.

Mrs. I., Dublin. Widow of a pensioner, receives £1 10s. monthly. Age 62.

Mrs. E., Dublin. Widow of 2nd Class Staff-Sergeant, receives £2 monthly. Age 42.

Mrs. S., Dublin. Widow of Corporal A.H.C., receives £2 monthly. Age 60.

Mrs. R., Dublin. Widow of 2512 A.H.C., receives £2 monthly. Age 45.

Child P., Cahir. Child of late No. 7150 2nd Class Staff-Sergeant. Guardian receives £1 5s. monthly.

Mrs. C., Norwich. Widow of a Private, receives £2 monthly. Age 38.

Mrs. S., London. Widow of a Private, receives £2 monthly. Age 36.

Aldershot,

October 8, 1904.

(Signed) G. St. C. THOM, *Captain,*

For Hon. Sec. Aldershot Sub-Committee.

ROYAL ARMY MEDICAL CORPS COMPASSIONATE FUND.

WIDOWS' AND ORPHANS' FUND.

Dr.		BALANCE SHEET FOR THE QUARTER ENDED SEPTEMBER 30, 1904.		Cr.
1904.	RECEIPTS.	£ s. d.	EXPENDITURE.	£ s. d.
	Credit Balance from last Quarter :—		Monthly disbursements to 13 Widows and 1 Orphan	70 0 0
	At Bank	48 16 5	Donation to Mrs. B.	2 0 0
	On Deposit (and Interest)	618 12 3	Clerk	0 10 0
			Postage	0 2 7
			Cheque-book	0 5 0
			Balance :—	
			At Bank	75 18 10
			On Deposit (Interest)	518 12 3
		<u>£637 8 8</u>		<u>£667 8 8</u>
ALDERSHOT, October 8, 1904.	(Signed) G. W. ROBINSON, Lieutenant-Colonel.		(Signed) G. ST. C. THOM, Captain, For Hon. Sec., Aldershot Sub-Committee.	

GENERAL RELIEF FUND.

Dr.		BALANCE SHEET FOR THE QUARTER ENDED SEPTEMBER 30, 1904		Cr.
1904.	RECEIPTS	£ s. d.	EXPENDITURE.	£ s. d.
Aug. 24	Credit Balance from last Quarter	71 19 4	Disbursement to Six Cases requiring Monthly Relief	30 10 0
	By Sale of Kits from South Africa unclaimed; from O.C. Depot, R.A.M.C.	2 18 10	Maintenance of Child of Sergeant S., 2 weeks, Convalescent Home, Southsea	0 13 0
			Clerk, 10s.; Postage, 1s. 7d.; Cheque-book, 5s.	0 16 7
			Balance at Bank	42 18 7
		<u>£74 18 2</u>		<u>£74 18 2</u>
ALDERSHOT October 8, 1904.			(Signed) G. ST. C. THOM, Captain, For Hon. Sec., Aldershot Sub-Committee.	

R.A.M.C. FUND.

BAND FUND.

DR.		BALANCE SHEET FOR THE QUARTER ENDED SEPTEMBER 30, 1904.										CR.
		RECEIPTS.				EXPENDITURE.						
1904.		1904.				1904.				£	s.	d.
July	1	Credit Balance ..	..	..	..	July	29	Pay of Band (July)	..	..	..	20 11 6
"	20	President, R.A.M.C. Mess (June Subscription) ..	..	..	..	Aug.	6	Expenses of Band to Netley ..	..	..	..	10 0 0
"	26	Hon. Sec., R.A.M.C. Fund (Quarterly Grant) ..	..	..	..	"	31	Pay of Band (August)..	..	..	..	23 14 8
Aug.	3	Holt and Co. (one Subscription) ..	..	..	..	"	"	Expenses of Band (Holloway Sanatorium)	..	..	..	3 5 0
"	17	President, R.A.M.C. Mess (July Subscription) ..	..	..	..	"	"	Pay of Band (Holloway Sanatorium)	..	..	..	8 2 0
"	19	President, Regimental Institute, Netley ..	..	..	..	Sept.	26	Expenses of Band to R.A.M. College	..	..	..	2 8 9
Sept.	3	Secretary, Holloway Sanatorium ..	..	..	..	"	30	Pay of Band, £20 2s. 11d.; Postage, 2s. 10d.	..	..	..	20 5 9
"	12	President, R.A.M.C. Mess (August Subscription)..	..	..	..	"	"	Hawkes and Son, Repairs, New Instruments, &c.	..	..	..	27 3 5
"	30	President, R.A.M.C. Mess (September Subscription)	..	..	..	"	"	Balance ..	..	..	..	11 11 10
										£127	2 11	

ALDERSHOT,
October 8, 1904.

(Signed) G. ST. C. THOM, Captain.
For Hon. Sec., Aldershot Sub-Committee.

NOTICE TO SUBSCRIBERS.

OFFICERS are particularly requested to give timely notice of changes of station or changes of address, in order to ensure the posting of the JOURNAL to its correct destination.

The Editor will be glad to receive original communications upon professional subjects, travel, and personal experiences, &c. He will also be glad to receive items of news and information regarding matters of interest to the Corps from the various garrisons, districts and commands at home and abroad. All these communications should be written upon one side of the paper only, they should by preference be type-written, but, if not, all proper names should be written in capital letters (or printed) to avoid mistakes, and be addressed to the Editor, JOURNAL OF THE ROYAL ARMY MEDICAL CORPS, 68, Victoria Street, London, S.W.

Letters regarding subscriptions, non-delivery of the JOURNAL, or change of address, should be sent to Major T. McCulloch, R.A.M.C., 68, Victoria Street, London, S.W.

Communications have been received from Lieutenant-Colonels R. H. Firth, W. Dick, G. H. Younge (R.); Majors C. W. R. Healey, J. C. Morgan, J. S. Edye, S. Glenn Allen, A. W. Bewley, R. J. Windle, C. E. J. Stalkartt; Captains S. Cummins, F. E. Gunter, C. M. Mainprize, W. A. Ward, J. W. West; Lieutenants N. E. Harding, K. H. Reed, W. C. Rivers; Dr. A. Theiler.

In the event of reprints of articles being required by the authors, notification of such must be sent when submitting the papers. Reprints may be obtained at the following rates:—

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25 Copies of 4 pp.	4	6	Of 8 pp.	7	6	Extra for covers	4	0
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In forwarding parts for binding the name and address of sender should be enclosed in parcel.

The following periodicals have been received: *The Medical Record*, *The Medical News*, *New York Medical Journal*, *American Medicine*, *Gazette Med. de Paris*, *Archives de Medicine et de Pharmacie Militaires*, *Il Morgagni*, *Gazetta Medico-Italiana*, *The Medical Review*, *El Siglo Medico*, *Der Militärarzt*, *Deutsche Militärärztliche Zeitschrift*, *Anales de Sanidad Militar*, *Revue Med. de la Suisse Romande*, *La Medicina Militar Espanola*, *The Boston Medical and Surgical Journal*, *Annali di Med. Navale*, *Giornale del Regio Esercito*, *Le Caducée*, *The Hospital*, *The Ophthalmoscope*, *St. Thomas's Hospital Gazette*, *Bulletin de l'Acad. de Med. de Paris*, *Arch. Med. Belges*, *Voyenno Medisinskii*, *The Indian Medical Gazette*, *The Australasian Medical Gazette*, *Journal of the Association of Military Surgeons, U.S.*, *Militär-lagen unget af Militär-lægeforeningen, i Kjobenhavn*, *The Veterinary Journal*, *The Practitioner*, *Public Health*, *Medical Review*, *Journal of Infectious Diseases*, *Chicago*, *The Army and Navy Gazette*, *The United Service Gazette*, *Journal of the Royal United Service Institution*, *The Johns Hopkins Press*.

We desire to remind members who paid their first year's subscription by cheque or postal order that the annual subscription is due on July 1, and it is very important that such should be promptly paid.

All Applications for Advertisements to be made to—

G. STREET & CO., LTD., 8, SERLE STREET, LONDON, W.C.

The back outside cover is not available for advertisements.

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NOTICE.

The Corps News is now printed as an inset to the JOURNAL and separate copies may be subscribed for, price 2d. monthly.

JOURNAL OF THE ROYAL ARMY MEDICAL CORPS.

Corps News.

DECEMBER, 1904.

ROYAL ARMY MEDICAL CORPS.

Lieutenant-Colonel J. Maconachie, F.R.C.S. Edin., is placed on temporary half-pay on account of ill-health. Dated October 11, 1904.

The undermentioned Majors to be Lieutenant-Colonels. Dated August 2, 1904 :— W. C. Beevor, M.B., C.M.G., J. Maher, G. D. Hunter, D.S.O., J. R. Mallins, M.B., H. N. Thompson, M.B., D.S.O., N. Manders, S. F. Freyer, M.D., C.M.G. (Provisional), Brevet Lieutenant-Colonel C. Birt, R. S. F. Henderson, M.B.

The promotion of Major A. F. Tyrrell bears date October 25, 1904, instead of as notified in the Gazette of August 5, 1904.

The undermentioned Captains to be Majors. Dated November 30, 1904 :— F. R. Buswell, F. A. Symons, M.B.

Captain H. H. Norman, from temporary half-pay, to be Captain, with precedence next below M. H. Babington. Dated October 19, 1904.

Captain F. S. Walker, F.R.C.S.I., from temporary half-pay, to be Captain. Dated October 19, 1904.

SPECIALIST EXAMINATION.

At the recent Examination held at the Royal Army Medical College, London, the undermentioned Officers passed in the subjects specified :—

Major T. McDermott, and Major T. W. Gibbard, Specialists in Ophthalmology; Major G. S. Crawford, Passed in Midwifery and Gynæcology; Major C. E. Pollock, Specialist in Dermatology.

DEPÔT, R.A.M.C.

Captain E. B. Steel relieved Major G. S. McLoughlin, D.S.O., of the Command of "C" Company Dépôt, Royal Army Medical Corps, on November 10, 1904.

Captain G. St. C. Thom, assumed the duties of Adjutant, Dépôt, Royal Army Medical Corps, Major H. A. Hinge, who took up the Command of "B" Company, from November 10, 1904, inclusive.

ARMY MEDICAL RESERVE OF OFFICERS.

Surgeon-Lieutenant C. R. Browne, M.D., 3rd Volunteer Battalion, The Gloucestershire Regiment, to be Surgeon-Lieutenant. Dated October 19, 1904.

ROYAL ARMY MEDICAL CORPS (VOLUNTEERS).

The London Companies.—Surgeon-Lieutenant-Colonel J. Cantlie, M.B., 7th Middlesex (London Scottish) Volunteer Rifle Corps, and Honorary Lieutenant-Colonel Commandant Maidstone Companies Royal Army Medical Corps (Volunteers), is appointed to the Honorary Colonelcy of the Companies, dated October 22, 1904.

The Manchester Companies.—Captain R. W. Clements, M.B., Royal Army Medical Corps, to be Adjutant, vice Major H. D. Mason, whose period of appointment has expired, dated October 12, 1904.

The Woolwich Companies.—Lieutenant A. M. Porteous is retired under paragraph 37, Volunteer Regulations, dated November 5, 1904.

South Wales Border Beaver Company.—Lieutenant J. F. Dwyer resigns his Commission, dated November 5, 1904.

HONOURABLE ARTILLERY COMPANY OF LONDON.

Surgeon-Major W. C. James, M.D., is granted the honorary rank of Surgeon-Lieutenant-Colonel, dated November 5, 1904.

VOLUNTEER CORPS.

3rd Middlesex R.G.A. Vols.—Surgeon-Major A. Lingard to be Surgeon-Lieutenant-Colonel, dated October 15, 1904.

1st Northumberland R.G.A. Vols.—Surgeon-Captain J. V. W. Rutherford to be Surgeon-Major, dated October 15, 1904.

3rd Volunteer Battalion the Royal Welsh Fusiliers.—Surgeon-Major W. J. Morris resigns his Commission, with permission to retain his rank and to wear the prescribed uniform, dated October 15, 1904.

2nd Volunteer Battalion the Queen's Own (Royal West Kent Regiment).—Surgeon-Lieutenant J. Hamilton to be Surgeon-Captain, dated October 15, 1904.

6th Volunteer Battalion the Royal Scots (Lothian Regiment).—James Henry Horsburgh, Gent., to be Surgeon-Lieutenant, dated October 22, 1904.

1st Volunteer Battalion the Buffs (East Kent Regiment).—Surgeon-Lieutenant C. M. Atkinson resigns his Commission, dated October 22, 1904.

1st Hertfordshire.—Brigade-Surgeon Lieutenant-Colonel P. B. Giles is granted the honorary rank of Surgeon-Colonel, dated October 22, 1904.

1st Caithness.—Surgeon-Captain D. Durran, M.B., to be Surgeon-Major, dated October 29, 1904.

2nd Cinque Ports.—Surgeon-Lieutenant C. R. Skyrme to be Surgeon-Captain, dated October 29, 1904.

2nd (Prince of Wales's) Volunteer Battalion the Devonshire Regiment.—Peter George Moran, Gent., to be Surgeon-Lieutenant, dated October 29, 1904.

2nd Volunteer Battalion the King's (Shropshire Light Infantry).—The undermentioned Surgeon-Lieutenant-Colonels are granted the honorary rank of Surgeon-Colonel: R. de la P. Beresford, M.D., dated October 29, 1904; C. H. Gwynn, M.D., dated October 29, 1904.

1st Gloucestershire R.G.A. Vols.—Surgeon-Major D. S. Davies, M.D., to be Surgeon-Lieutenant-Colonel, dated November 5, 1904.

1st Cheshire Royal Engineers, Volunteers.—James Herbert Dixon, Gent., to be Surgeon-Lieutenant, dated November 5, 1904.

20th Middlesex (Artists').—Surgeon-Major (Honorary Captain in the Army) R. R. Sleman is granted the honorary rank of Surgeon-Lieutenant-Colonel, dated November 5, 1904.

1st Cardigan Royal Garrison Artillery, Volunteers.—Surgeon-Lieutenant A. Thomas, M.B., to be Surgeon-Captain, dated November 12, 1904.

The Queen's Rifle Volunteer Brigade, the Royal Scots (Lothian Regiment).—Surgeon-Major W. H. Miller, M.D., resigns his commission, dated November 12, 1904.

1st (Brecknockshire) Volunteer Battalion the South Wales Borderers.—Surgeon-Lieutenant J. Griffiths to be Surgeon-Captain, dated November 12, 1904.

ROYAL MALTA ARTILLERY.

The following notification is substituted for that which appeared in the Gazette of October 4, 1904: Robert Randon, M.D., Gent., to be Surgeon-Lieutenant (with local and temporary rank) to complete establishment, dated October 5, 1904.

ARRIVALS HOME.—From Sierra Leone: Lieutenant J. W. S. Seccombe. From Malta: Lieutenant-Colonel M. Dundon and Major C. J. Macdonald. From India: Lieutenant-Colonel G. D. Hunter, D.S.O.; Majors H. I. Pocock, F. W. G. Hall; Captains W. P. Gwynn, B. Watts, and J. Matthews. From South Africa: Lieutenant-Colonel H. J. R. Moberly; Captains J. J. M. Sloan, D.S.O., H. D. Packer, H. K. Palmer, and J. I. W. Morris.

ARRIVALS HOME ON LEAVE.—Lieutenant-Colonel T. J. R. Lucas, C.B.; Major H. D. James; Captains R. C. Wilson, and E. Brodribb.

EMBARKATIONS.—For Bermuda: Captain S. F. St. D. Green. For Ceylon: Captain J. L. Jones. For Hong Kong: Lieutenant R. M. Ranking. For Straits Settlements: Lieutenant J. H. Duguid.

EXCHANGES.—Major N. Marder exchanged with Major J. R. Forrest.

POSTINGS.—Lieutenant-Colonel M. Dundon to Western District; Lieutenant-Colonel G. D. Hunter, D.S.O., to Southern District; Lieutenant-Colonel H. J. R. Moberly to Southampton, as Embarkation Medical Officer; Major C. J. Macdonald to Ireland; Major A. J. Chambers to Netley; Major F. W. G. Hall to North-Western District; Major H. I. Pocock to Aldershot; Captain S. G. Butler to Western District; Captain B. Watts to North-Eastern District; Captain W. P. Gwynn to Western District; Captain J. Matthews to Aldershot; Captain H. K. Palmer to Ireland; Captain H. D. Packer to Ireland; Captain J. M. Sloan, D.S.O., to Scottish District; and Captain J. I. W. Morris to Home District.

ROYAL ARMY MEDICAL CORPS.

CASUALTIES.—From October 11 to November 10 inclusive:—

Discharges.—6981 Staff-Sergeant H. James, medically unfit, October 20; 8482 Staff-

Sergeant E. Waters, medically unfit, October 30; 6269 Sergeant E. J. Nosworthy, 2nd period, October 9; 9851 Corporal R. Dainty, 1st period, October 20; 9863 Corporal T. Ray, 1st period, November 3; 19084 Private W. Dean, purchase, October 22.

To Army Reserve.—16320 Private H. B. Castle, October 14; 11578 Private A. Richford, October 20; 16373 Private C. G. Barney, October 21; 14912 Private S. Edwards, October 24; 16425 Private J. Morris, October 18; 16340 Private J. Rigby, October 15; 16345 Private G. Wheeler, October 20; 16392 Private F. Berry, October 23; 16433 Private F. Hampson, October 29; 11592 Private E. Rice, October 31; 16437 Private E. Walker, October 31.

Transfers to other Corps.—8523 Staff-Sergeant S. Gregg, Wilts. and Dorset Brigade Company (Royal Army Medical Corps Volunteers), October 21; 9043 Sergeant J. Murley, Colonial Government (North Nigeria) November 4; 19173 Private W. Homan, A.S. Corps, October 12; 19076 Private W. Andrews, R.G. Artillery, October 14; 19228 Private A. Sutherland, Gordon Highlanders, October 24; 19218 Private L. A. Matthews, Gordon Highlanders, October 24; 19143 Private H. Huxtable, A.S. Corps, November 1.

Embarkations.—To Barbados, per s.s. "Trent," October 12; 18235 Private G. Harding, 17734 Private A. R. Cooke, 17745 Private H. Bailey, 18423 Private R. C. Hanks, 12187 Private J. A. Brooks, 16153 Private S. Lyon, 17616 Private W. C. Stradling.

To Jamaica, per s.s. "Trent," October 12: 17584 Private W. Preston, 12493 Private C. A. T. Hughes, 17820 Private H. Peckham, 18212 Private J. Mason, 18866 Private N. Thomas, 18853 Private S. Wilcock.

To Bermuda, per s.s. "Mongolian," October 17: 8826 Staff-Sergeant B. Townend, 18152 Private J. Oswald, 18158 Private G. P. Pursey, 18836 Private J. E. Smith.

To Nova Scotia, per s.s. "Buenos Ayres," October 15: 18254 A. W. Wright.

To Ceylon, per s.s. "Dilwara," November 3: 8179 Sergeant G. Barlow, 15955 Lance-Corporal H. G. Miller, 18713 Lance-Corporal W. H. Ellis, 12624 Private P. Farrell, 18226 Private L. V. Bilbee, 18498 Private E. R. Ross, 18330 Private J. H. Mercer, 11836 Private C. Pitt, 12309 Private E. Barber, 18855 Private J. Ellison, 18992 Private R. J. Brennan.

To Singapore, per s.s. "Dilwara," November 3: 17183 Corporal J. T. Robertson, 16007 Private C. Blatch, 18648 Private J. B. Haley, 17506 Private P. Blong, 16893 Private J. Hunt, 16051 Private W. McFarlane.

To Hong Kong, per s.s. "Dilwara," November 3: 7262 Sergeant-Major J. Hutton, 11051 Sergeant H. Williams, 9703 Sergeant W. B. Heponstall, 11509 Sergeant J. J. Earp, 12386 Sergeant E. Purchase, 15808 Corporal C. Pinner, 7768 Corporal L. Browne, 16497 Lance-Corporal W. H. Rann, 18136 Private H. Day, 12357 Private H. W. Griffin, 16955 Private C. White, 18730 Private F. Tester, 12738 Private C. D. De Haney, 1340 Private F. Edwards, 15512 Private A. Gilchrist, 16825 Private R. Heffeman, 12184 Private P. Holland, 10458 Private W. Langston, 18462 Private F. Johnson, 17810 Private F. Suitters, 18352 Private G. Walden, 12949 Private W. Scott, 18962 Private F. H. Morris.

To Wei-hai-Wei, per s.s. "Dilwara," November 3: 13202 Private C. Pask.

To Peking, per s.s. "Dilwara," November 3: 9852 Staff-Sergeant C. G. Guernsey.

To Ceylon, per s.s. "Ophir," 10126 Sergeant J. Hedley.

Disembarkations.—From Malta, per s.s. "Dilwara," November 22: 5517 Sergeant-Major J. T. W. Hayward, 17849 Lance-Corporal C. C. Banks, 16451 Private G. Morley, 16922 Private S. Watson, 13814 Private P. Kenneally.

From Egypt, per s.s. "Dilwara," November 22: 16008 Private R. Barnett, 47550 Private H. Holland, 16136 Private F. Young, 17127 Private J. Tettow.

From Bermuda, per s.s. "Beta," October 24: 15598 Sergeant J. Barnes.

From Canada, per s.s. "Ionian," November 5: 9538 Private J. Keating.

From Malta, per s.s. "Soudan," November 12: 17577 Private A. E. Lawrence, 18253 Private J. Suter.

From South Africa, per s.s. "Dunera," November 10: 6440 Sergeant-Major F. W. Nelson, 6962 Quartermaster-Sergeant J. T. Fry, 6314 Quartermaster-Sergeant E. T. Smith, 7839 Staff-Sergeant M. Powell, 6698 Staff-Sergeant F. Wheeldon, 10221 Sergeant E. Lorner, 9856 Sergeant A. Buller, 7425 Lance-Sergeant F. S. J. Chowne, 7665 Lance-Sergeant J. W. Gibbs, 9849 Lance-Sergeant F. J. Mallan, 9231 Lance-Sergeant W. E. Thompson, 8982 Corporal F. O. Light, 11361 Corporal G. E. Letchford, 16657 Private W. H. Beck, 11387 Private H. A. W. Bignell, 8898 Private T. Day, 12621 Private H. Howe, 12002 Private W. J. Kneee, 12628 Private J. R. Lunney, 15628 Private A. N. O. Meekums, 11828 Private W. Morrish, 15618 Private S. Orritt, 7517 Private A. Peckover, 15623 Private W. J. Ramsay, 18315 Private R. Sheraton, 10252 Private J. Sullivan, 15672 Private I. Standing, 18611 Private W. Tomlin, 15615 Private H. Winkley, 14834 Private A. Rigling, 14378 Private F. Proctor, 15391 Private C. Thompson.

QUEEN ALEXANDRA'S IMPERIAL MILITARY NURSING SERVICE :—

Appointments.—To be Staff-Nurses.—Miss A. E. Ansdell, posted to Alton; Miss L. Belcher, posted to Woolwich; Miss C. T. Bilton, posted to Hounslow; Miss E. Eardly, posted to York; Miss E. C. Fox, posted to Connaught Hospital, Aldershot; Miss G. S. Jacob, posted to Alton; Miss M. O. C. McCreery, serving at Dover; Miss M. E. Neville, serving at Malta; Miss F. N. Roberts, posted to York; Miss E. M. Robinson, posted to Woolwich; Miss D. J. Saunder, posted to Royal Arsenal, Woolwich; Miss F. A. L. Smith, posted to York; Miss A. Willes, posted to Netley.

Resignations : The following ladies have resigned their appointments. Sister: Miss G. A. Magill. Staff Nurse: Miss K. Ward.

Appointments Confirmed : Sister: Miss M. Steenson. Staff-Nurses: Miss W. M. Jay, Miss F. M. MacGregor, Miss M. MacGregor, Miss C. Mackay, Miss B. F. Perkins.

Promotions : The undermentioned Staff-Nurses to be Sisters: Miss E. H. Hay, Miss E. J. M. Keene, Miss K. Pearse, Miss S. Smyth, Miss D. M. Taylor, Miss A. L. Walker.

Changes of Station : —

Sisters: Miss A. Guthrie, Malta to Station Hospital, Rochester Row, S.W.; Miss E. J. M. Keene, Woolwich to York; Miss S. B. Lanyon, Hounslow to Woolwich; Miss C. K. E. Steele, Malta to Connaught Hospital, Aldershot.

NOTES FROM ALDERSHOT.—The first meeting of the Winter Session, 1904-05, of the Aldershot Military Medical Society took place in the Library of the Cambridge Hospital, on November 4, 1904. Surgeon-General G. MacNamara, M.D., C.B., C.M.G., in the chair. A paper was read by Lieutenant-Colonel W. Pike, D.S.O., on "Riders' Sprain" and a case shown, and discussion followed.

Major Scaulan showed a case of commencing aneurism of the aorta and innominate vessels.

Captain Thom read a paper on "Suppurative Meningitis, followed by Operation."

Lieutenant Turner showed a case of varicose condition of the veins of the abdomen and chest, in a man who had been convalescent for some months from enteric fever followed by phlebitis; and discussion followed as to the probable cause.

Lieutenant Turner also read a paper on "Two Cases of Perforating Gastric Ulcer and Operation."

Major J. S. Edye read a paper on "120 Cases of Enteric Fever; and four different Methods of Treatment carried out; with the results obtained in each series of cases."

A new Honorary Secretary was elected; Lieutenant-Colonel W. Pike, D.S.O., being under orders for Madras, handed over the "reins of government" to Major Powell, and received universal thanks for his past administration of the Society.

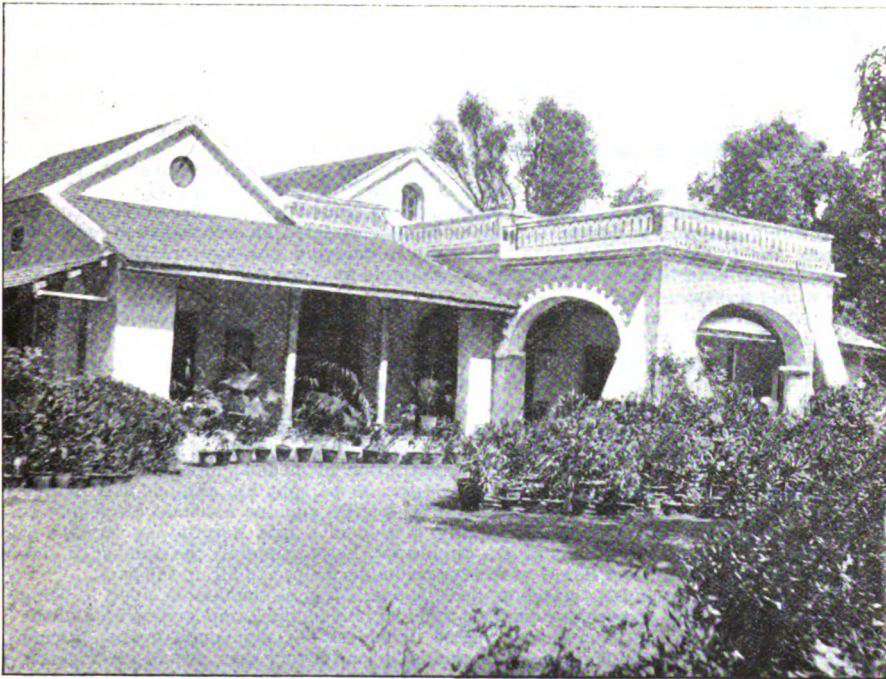
NOTES FROM BANGALORE.—Lieutenant-Colonel H. Forman writes of the Mess: "The R.A.M.C. Mess, Bangalore, was founded by the late Surgeon-General Inkson, in 1892, when he was Principal Medical Officer here, and after him was nursed by the late Colonel Gage, who succeeded him as Principal Medical Officer. A large portrait of each of these officers is hung in the ante-room. Later on, about 1894, the present Deputy D.G. Surgeon-General Keogh did much to place it on a sound financial basis—a position which, since then, it has never lost. In the redistribution the office of Principal Medical Officer, Bangalore, became an Indian Medical Staff billet, which was somewhat unfortunate, for it involved the Officer Commanding Station Hospital becoming the head of the Mess, to the exclusion of the Principal Medical Officer, who, of necessity, became an Honorary Member. Socially at first this led to confusion, but that was only temporary, and it is now clearly understood that the Principal Medical Officer stands very much in the same relationship to the Mess as the General Officer Commanding does to any regimental Mess.

"A photograph of the Mess is appended. Up till a few months ago we had two quarters for officers in the building, we have now four. Thanks to the sound finance of the Mess, we are now enabled to carry out these extensive improvements on the following agreement with the landlord: The rent was fixed at 140 rupees per month, but we advanced the landlord 2,000 rupees, on an agreement, first, that we should have a five years' lease, terminable on our side at six months' notice, but not on his; and secondly, that he should pay us back the advance, at the rate of 40 rupees per month, i.e., we are to occupy the building for four years and two months, at the rent of 100 rupees per month. We get a Government allowance of 80 rupees, and the four quarters are let to the junior officers, furnished, at 31 rupees per month each; thus, for the next four years we will have an income monthly of 204 rupees, and a rent of 100 rupees. This is not a bad investment for our 2,000 rupees, and the young officers are better and more cheaply housed than they would be otherwise.

"The Mess is well furnished throughout, and we have quite a respectable show of silver plate. When the Mandalay Mess closed, owing to the transfer of the troops to Maymyo we applied for and got their plate, &c., on the understanding that we should return it if a Mess was opened in Burma in the next five years. The garden is one of the best in Bangalore, itself a place famous for its gardens. There are biennial flower-shows held, and it is seldom that we do not take one or more first prizes.

"A scheme is well advanced for lighting the roads and some of the houses by electricity from the Cauvery Falls. All buildings cannot be lit, because the amount of power available is limited, most of it being utilised for the Kolar Gold Fields, but knowing this we made early application and have the promise that we shall get the light. It is expected that it will be in full working order about June, 1905; the plant is already *en route* and the installation will cost 500 rupees.

"The financial position of the Mess is excellent. The last quarter's balance sheet shows:—Assets 5,755 rupees, liabilities 1,500 rupees. The principal item in the assets is the furniture and garden, which we put down at 3,055 rupees. This, as a matter of



fact, is ridiculously low; at a rough estimate I should say that even a forced sale would realise at least 6,000 rupees, probably considerably more. The liability of 1,500 rupees, is for debentures subscribed for by Junior Officers. Since the balance was struck (September 25), 500 rupees have been redeemed.

"The cooking is very good, the cook having been trained by Lieutenant-Colonel Yourdi when he was quartered here, and he is a well-known adept in such matters.

"The inclusive cost of messing is 2 rupees per day, no extras are charged for except ice, and very little of that is required in Bangalore. Even at this low rate the profit on messing for the last quarter was 373 rupees. This is undoubtedly a result of the close personal supervision exercised over all expenditure by the Honorary Secretary, Captain W. A. Ward, and it shows how necessary such supervision is, and how profitable it is also. The wines we get out in wood and bottle in the Mess. This we have found very satisfactory because we can get a better article at a cheaper rate. The wines are sold at 10 per cent. on cost price. The profit on wines including cigars

and cigarettes was 101 rupees for the quarter, which shows that whatever else they may be the present staff of officers can scarcely be accused of being dipsomaniacs. It may be useful to other Messes to know from whom we get our wines, &c.

"Saccone and Co., Gibraltar, supply sherry, maderia, port and marsala. Charles Wilkinson and Co., of West Regent Street, Glasgow, and Rangoon St., E.C., supply whisky. They are well-known blenders. De Gernan et Cie, Rue du Paré, Bordeaux, supply claret. All other wines we get locally.

"Allowing a few rupees for Mess contingencies, newspapers and the like, it will be seen from the above that the Junior Officers can live here in this Mess for about 100 rupees a month, and live well too; all other expenses are voluntary.

"The Corps has no reason to feel ashamed of its Mess in Bangalore; on the contrary, for its size I doubt if there is another Mess in India, regimental or otherwise, that can equal it; certainly there is not one that can beat it."

NOTES FROM THE BARBADOS COMMAND.—Lieutenant-Colonel F. P. Nichols, R.A.M.C., Officer Commanding Station Hospital, Barbados, writes:—Lieutenant S. M. Adye-Curran having returned on September 26, 1904, after three months' leave of absence, is posted to St. Lucia for duty.

Lieutenant-Colonel H. C. Kirkpatrick arrived on October 24, 1904, and assumed the duties of Senior Medical Officer, *vice* Lieutenant-Colonel E. O. Milward, tour expired.

Major G. H. Barefoot returned from three months' sick leave on October 24, 1904, and resumed duty as Officer Commanding Station Hospital, St. Lucia.

Captain J. P. Silver arrived on October 24, 1904, and remained at Barbados for duty. Seven men of the R.A.M.C. also arrived for duty on October 24, 1904.

NOTES FROM BULFORD CAMP, SALISBURY PLAIN.—Captain C. M. Fleury, R.A.M.C., writes that a most successful concert was given on November 11, in the Soldiers' Institute, by the N.C.O.s, and men of the 20th Company, R.A.M.C.

"If the attendance constituted a record, nothing could have exceeded the enthusiasm of the audience, and the promoters are to be congratulated on securing such excellent talent, and to the lead they have set locally in carrying out and entering into the spirit of the entertainments generally, an example we hope will be continued during the winter season.

"At the end a humorous sketch was given, in which Serjeant-Major Norvill, Corporal Elliot, Privates Rogers, Ball, Cooke, and Partridge took part."

NOTES FROM GYANTSE.—Captain Mainprise, R.A.M.C., has gone on with his field hospital to Lhasa along with the Mission. Captain Connolly, R.A.M.C., has also had the luck to reach the forbidden city with the Royal Fusiliers.

Captain Stevenson, R.A.M.C., stationed at Chumbi with A/22 British Field Hospital, received orders to move up to Gyantse, and arrived there on August 2, after thirteen days' march. A new departure in the organisation of medical units on service was introduced by the P.M.O. by ordering the Section to be split up, and one half section to be left at Chumbi, in charge of Captain Fry, I.M.S., and one Assistant Surgeon. It was rather a difficult matter to divide up a section of a field hospital, as very few of the drugs or articles of equipment are duplicated, but fortunately the number of sick at Chumbi was small, and Box G of reserve medicines helped to fill up the gaps.

Gyantse has quite a large garrison, and the demolition of the famous Jong is being rapidly carried out. Troops are confined more or less to the camp perimeter, and the big Gompa behind the Jong is only visited under escort. A splendid hockey ground has been prepared by the 23rd Pioneers, and every one is very keen, two or three games taking place every afternoon. An elevation of 12,000 feet is not an ideal height for very violent exercise, but one soon gets accustomed to it, and the pace is quite as hot as in the plains of India. Gyantse lies in a broad valley, with many smaller valleys running into it from every side. It is well known that there is excellent shooting to be had in these valleys, but unfortunately they lie outside the two mile limit, beyond which no one is allowed to go, so we have to content ourselves with shooting hares, of which there are a lot along the stony bases of the hills, pigeon, and an occasional teal or Brahminy duck on the river.

Major Aldridge, R.A.M.C., Senior Medical Officer, Lines of Communication, arrived at Gyantse on August 13, on a tour of inspection of the various posts on the line. He left again on the 16th for Chumbi.

A supply of a new pattern support for patients able to ride on ambulance mules, devised by Lieutenant-Colonel Hathaway, R.A.M.C., has been received for trial. The support is made on the principle of the swinging canvas back of an ordinary camp chair, with iron frame attaching to the back of the saddle, and a canvas belt buckling round the patient's waist.

The question of ambulance mules is just now a burning one. As mules are the only sort of ambulance transport suitable to the country, each section by regulations receives twenty-four mules, these mules to be under the Medical Officer, and only to be used for other purposes in exceptional cases, and then only by order of the General Officer Commanding. On this Expedition, however, the Supply and Transport Corps have claimed the right to use hospital mules for transport purposes, with most disastrous results. Now the mules have been taken entirely away from the Medical Officer and given to the Supply and Transport Officer to use as he pleases, the Medical Officer having to requisition mules for ambulance work from the Supply and Transport Officer, only to be told that none are available. The result of this policy has been not only a great amount of extra worry and correspondence to the Medical Officer, but in many cases the sick have suffered.

The Lhasa Column left there on their return march on 23rd.

Captain Cooke Young, I.M.S., who was so severely wounded by a fanatical Lama in the camp at Lhasa, arrived at Gyantse on 12th on his way to India. He is almost well again.

A/22 British Field Hospital left Gyantse on 16th for the base, and will reach Siliguri on October 8th, going on to Calcutta to demobilise. Severe snowstorms interfered with sport on the march to Chumbi, but Captain Stevenson, R.A.M.C., secured a good burhel and several gazelle.

NOTES FROM THE HOME DISTRICT.—Major E. Mc.K. Williams, R.A.M.C., has been posted to the Home District for duty, arriving off leave about the end of October.

Major J. Fayrer, R.A.M.C., has been posted, *vice* Captain E. B. Steel, to Medical Officership, Duke of York's School, Chelsea. The latter proceeds to Aldershot to command of "C" Company at the Dépôt.

Captain E. C. Hayes, R.A.M.C., succeeds Major Fayrer as Sub-Accountant, No. 18 Company, R.A.M.C., and is attached to the office of Principal Medical Officer.

Captain T. H. M. Clarke, C.M.G., D.S.O., has been granted three months' sick leave from October 10 by a Medical Board.

Lieutenant A. B. Smallman, M.B., R.A.M.C., and Lieutenant F. M. G. Tulloch, R.A.M.C., have been sent from the Royal Army Medical College to Aldershot for special duty in connection with anti typhoid inoculation; while Lieutenant L. Bousfield, M.B., proceeds from the latter Station to the College.

It is said that Surgeon-Lieutenant-Colonel Magill, C.B., Coldstream Guards, will be shortly transferred to the Royal Army Medical Corps.

NOTES FROM MALTA.—Captain Crawford Kennedy writes: "Two new Officers have arrived for duty, Major Trotter and Major Austen. Consequent on their arrival, and on the departure from the station (tour expired), of Lieutenant-Colonel Duncan and Major Macdonald, the following changes in appointments have been made:—

Officer in command Cottenera Hospital, Lieutenant-Colonel H. M. Sloggett.

Officer " " Sanatorium, Citta Vecchia, Major Trotter.

Officer Commanding Forrest Hospital, Major Nicolls.

Officer Commanding Imtarfa Hospital, Major Austen.

Officer Commanding Gozo, Captain Harvey.

Major Lawson (Bacteriologist), has moved from Imtarfa to Valletta Hospital for duty.

The following Officers are on leave: Colonel W. O. Wolseley (due to return in a few days), Captain Woodley.

The following are on sick leave: Lieutenant-Colonel R. Jennings, Captain Ryan.

Cricket Notes.

The Cricket Season is now over, and the members of the team in looking back have at any rate one performance to congratulate themselves on, viz., reaching the semi-final round for the Governor's Cup. It is quite a creditable performance for a small and scattered detachment as ours is in this island. During the season 15 Corps matches were played, 6 were won, 7 lost, and 2 drawn. Captain Bostock heads the batting list with an average of 49, and Private Hawes the bowling with an average of 10·5 runs per wicket.

NOTES FROM NETLEY.—Lieutenant-Colonel Twiss writes, giving the results of the Royal Victoria Hospital Cricket Club for the Season 1904:—

<i>First Eleven.</i>					<i>Second Eleven.</i>				
Matches won	..	..	..	13	Matches won	..	..	..	9
„ drawn	..	..	..	4	„ drawn	..	..	..	1
„ lost	..	..	..	6	„ lost	..	..	..	3
					„ tied	..	..	..	2

The following men finished with the best averages, and were handed cricket bats by Surgeon-General Sir E. Townsend on November 3, 1904.

<i>First Eleven.</i>				<i>Second Eleven.</i>			
Best batting	..	..	Private Turner	Best batting	..	..	Private Jones
„ bowling	..	..	„	„ bowling	..	..	„ Barber
2nd batting	..	..	„ Pitt	2nd batting	..	..	„ Miller
„ bowling	..	..	„ Wells	„ bowling	..	..	„ Young

Presentation of Good Conduct Medals.

Long Service and Good Conduct Medals were presented to No. 7438 Staff-Sergeant W. Argent, No. 7343 Corporal F. Blatchford, No. 7491 Private T. G. Hayhoe, on a review order parade, by Surgeon-General Sir E. Townsend, on November 1, 1904, who addressed to each recipient kindly words of congratulation.

A musical play by Lieutenant Lewis, consisting of fragments of those most recently popular, was presented in the theatre on October 26, 27, 28, and November 11. It was much appreciated by both patients and staff, and Mr. Lewis and the ladies and gentlemen who so kindly assisted are to be congratulated on the excellence of the performance.

NOTES FROM SIERRA LEONE.—Major F. Smith writes: "Captain Forrest, on arrival from home, has been posted to the Station Hospital, Tower Hill, for duty.

"Lieutenant Seccombe abandoned the contemplated shooting trip and has gone home, tour expired.

"Our popular Senior Medical Officer, Lieutenant-Colonel Bartlett, has been lying up for a week or two owing to an accident while out shooting. Just as he was bringing down the bush-fowl in great style, he got staked in the knee by one of the sharply pointed stumps which the native husbandman leaves behind him when he clears the bush for rice planting. Young trees are cut through on the slant, a foot or two off the ground—an aggressive-looking forest of short spears remains. It was the merest shave that the knee-joint was not penetrated. We are glad to see him back to duty not much worse for the accident.

"Our new Governor, Mr. Leslie Probyn, C.M.G., has arrived and is displaying great energy. After the ceremonial function of 'swearing in' and an inaugural grand 'At Home' at Government House, where a most picturesque crowd of native chiefs and others assembled on the lawn, His Excellency started on a tour among the native tribes of the Hinterland, and has not yet returned.

"The military hospital on Kortright Hill has ceased to be used as such. The building is being converted into a quarter for regimental officers. The sick from Kortright are to come down to the Station Hospital, Mount Aureol, for treatment.

"A portion of the South Atlantic Fleet has been paying us quite a long visit. The 'St. George,' the 'Brilliant,' and the 'Tartar' were here together, and cricket matches have been 'all the go.'

"Dreadful as it may seem, it is nevertheless a fact, that hockey is being played in Sierra Leone. This week the gunners beat the officers of the West Indian Regiment (2nd Battalion) in a great match on the King Tom cricket ground.

"We have also now a golf club, started through the energies of Major Thompson, Staff-Officer. The links are on the 'grass-fields.' The greens are brown earth."

BIRTHS.

ARCHER.—On September 30, 1904, to Captain and Mrs. Stoney Archer, a daughter.

MORRIS.—On October 22, at Blackheath, the wife of Major A. E. Morris, R.A.M.C., of a son.

STRATON.—On October 16, at Landour, India, the wife of Captain C. H. Straton, R.A.M.C., of a son.

MARRIAGES.

RITCHIE—BEER.—On October 15, at the Military Chapel, Mian Mir, Punjab, India, Theodore Francis Ritchie, M.B., Captain R.A.M.C., eldest son of the Rev. R. Ritchie, Rector, St. Mary's, Inverness, N.B., to Kate, youngest daughter of the late James Henry Beer, of Canterbury, and of Mrs. Beer, of Cranbourne Court, Albert Bridge, S.W.

SPILLER—TURLEY.—On November 8, at St. Augustine's, Edgbaston, by the Rev. W. O. Burrows, M.A., Vicar, assisted by the Rev. Geo. Ingle, M.A., Rector of

Wells, Norfolk (cousin to the bride), and the Rev. T. E. Healey, of Redditch, William Moreland Haliday Spiller, Captain R.A.M.C., eldest son of Mr. E. A. Spiller, Wellington Park, Belfast, to Annie Wood, second daughter of Mr. Theodore Turley, Rotherwood, Westfield Road, Edgbaston.

DEATHS.

PHILPOT.—Major Frederick Philpot, late of the Army Medical Staff, died on November 18, at Creswell House, Hastings Road, Bexhill, aged 71. He was appointed a dispenser in the Army in September, 1854; an apothecary, ranking as a Captain, in September, 1860, and received his first commission as Captain of Orderlies in the Army Hospital Corps in June, 1873, and was promoted Quartermaster and Honorary Captain in July, 1881, retiring with the honorary rank of Major in December, 1887. He served in the Crimean Campaign, 1854-56, being present at the Battle of Inkerman, Sevastopol, receiving the medal and Turkish medal. He took part in the Egyptian Campaign of 1882, receiving the medal and bronze star.

RYAN.—On October 7, at Ryde, in the Isle of Wight, Lieutenant-Colonel George Ryan, retired, Army Medical Staff, aged 59 years. He entered the Service March 31, 1868; was promoted Surgeon March 1, 1873; Surgeon-Major January 1, 1881; and Surgeon-Lieutenant-Colonel, January 1, 1889. His war services are: South African War, 1879. Zulu Campaign. Medal. He retired January 16, 1889.

WEBB.—On October 5, at his residence, 52, Beaumont Street, London, Honorary Deputy Inspector-General Henry March Webb, M.B., retired, Medical Department, aged 82 years. He entered the Service September 23, 1845; was promoted Surgeon December 8, 1854; and Surgeon-Major September 23, 1865. He retired November 12, 1870, with the honorary rank of Deputy Inspector-General.

ROYAL ARMY MEDICAL COLLEGE.

A VERY handsome silver Cup has been presented to the College Mess by the Civilian Members of the Advisory Board, of which it is hoped to give a photograph in our next issue. It bears the following inscription: "Presented to the Royal Army Medical College by the Civilian Members of the first appointed Advisory Board for Army Medical Services." Sir Charles B. Ball, M.Ch., James Galloway, Esq., M.A., M.D., Sir Alfred D. Fripp, M.S., C.V.O., C.B., Sir E. Cooper Perry, M.A., M.D., Sir Frederick Treves, Bart., K.C.V.O., C.B., LL.D.

Another very handsome cup, of which a photograph is given, has been presented to the Mess by the following Officers of late No. 2 General Hospital, Pretoria, S.A.: Surgeon-General Keogh, Lieutenant-Colonels Sylvester, Gibson, Lougheed, Burton, and Majors Sutton and Nicolls, with the following inscription: "Presented to the Royal Army Medical College Mess by the Officers of No. 2 General Hospital, Pretoria, 1900-1902."

AWARD OF ROYAL MEDALS.

MUCH interest attaches to the two Royal medals which the Sovereign places every year at the disposal of the Royal Society. One of these goes to Professor Burnside, F.R.S., for original and valuable mathematical research. The second is awarded to Colonel David Bruce, F.R.S., of the Army Medical Service, for his immensely useful work in Central Africa. Ten years ago Colonel Bruce proved that the Nagana and tsetse-fly diseases in Zululand were one and the same, and then, following up this discovery, he proved what was of cardinal import, that the tsetse-fly was the carrier of the parasitical blood organism which caused the malady. This great success he has seconded by another of equal, if not of still greater, moment, by showing that the "Sleeping Sickness" is also induced by a microscopic parasite, and that a species of the tsetse-fly acts as the carrier of the deadly organism. Like the mosquito which, in a similar fashion, acts as the transmitter of malaria, the tsetse-fly is now on what may be called the "infective insect list," and this is largely the result of the observations of the King's medallist.

THE following is an extract from the *Daily Mail*, dated September, 1904 :—

LEAP FROM A LINER.

GALLANT RESCUE BY A BRITISH OFFICER.

Marseilles, Thursday, September 29.

I have just seen one of the Officers of the Messageries steamer *Saghalien*, who gave me the following account of a deed of remarkable bravery performed by a British passenger while the ship was in the Ionian Sea :—

"About half-past nine in the morning one of the hands, named Fioramenti, fell overboard. There were only a few passengers on deck, but a sailor threw a lifebuoy to the drowning man and a passenger sent a deck chair after it. The sea was running very high and a strong wind was blowing. The order was given to stop the vessel, but before it could be executed Captain Thomas Campbell MacKenzie, of the Royal Army Medical Corps, dived, fully dressed, over the ship's side.

"A lady tried to hold him back, but the Captain eluded her, and was soon swimming towards Fioramenti. With the assistance of a life-belt he kept the sailor afloat for three-quarters of an hour, in spite of the heavy seas which were dashing over them, and at last both men were rescued in an exhausted condition by a boat from the *Saghalien*.

"Captain MacKenzie met with a tremendous reception when he stepped on deck again, women weeping for joy. The male passengers drew up a petition to the French Minister of Marine asking that the British Officer should be decorated for his bravery. It is doubtful, however, if Captain MacKenzie would accept any recompense, as he is extremely modest and refused all requests to be interviewed."

"Pitman's Speed Certificate for 200 words per minute and a Silver Medal have been awarded to * James McDonald, P.M.O.'s Office, Dublin Castle, as the result of an Examination held at the Dublin School of Shorthand, 4, South Anne Street, on October 3, under the following Committee: Dr. White, Mr. H. du Boys, Mr. F. P. Long (Solicitor), and the Rev. J. J. O'Reilly (Secretary).

ex. Pitman's Phonetic Journal,
October 22, 1904.

THE CENTRAL BRITISH RED CROSS COUNCIL.

68, VICTORIA STREET, WESTMINSTER, S.W.,

November 21, 1901.

TO THE EDITOR OF THE "JOURNAL OF THE ROYAL ARMY MEDICAL CORPS."

SIR,—The Central British Red Cross Council desires to bring the very important question of the organisation of the voluntary aid resources of this country prominently before the public, and to make an appeal for funds with the object of extending and developing Red Cross organisation on a scale commensurate with the requirements of the country.

Her Majesty Queen Alexandra is President, and the Council is constituted as follows :—

Representatives of the National Society for Aid to the Sick and Wounded in War; of the St. John Ambulance Association; of the St. Andrew's Ambulance Association; of the Army Nursing Service Reserve; of the Admiralty; and of the War Office.

Chairman, Viscount Knutsford, G.C.M.G.; *Hon. Treasurer*, Sir John Furley, C.B.; *Hon. Secretary*, Major T. McCulloch, M.B., Deputy Assistant Director-General, A.M.S.

The Central British Red Cross Council was started in January, 1899, with the full approval of the War Office, and is now officially recognised by all Foreign Chancelleries as the central body authorised to deal with Red Cross matters throughout the Empire.

The functions of the Council may be stated shortly as follows :—

(1) To act as the recognised medium of communication with the Red Cross organisations of other countries.

* This has reference to No. 17,619 Private J. McDonald, No. 14 Company, Dublin, and constitutes a record for the Army.



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(2) To be the medium of official communication between the naval and military authorities and voluntary aid societies and their branches.

(3) To promote the extension and organisation of voluntary aid resources throughout the Empire.

The lessons of the past have shown that arrangements not preconceived or systematised beforehand in time of peace must necessarily be imperfect under the sudden emergencies of war. We have learned from previous experience not only that, in presence of a state of war, money subscriptions, donations in kind, and offers of personal services have always been freely given, and that an appeal to the public has invariably met with most generous response, but also that it is absolutely necessary to prepare in advance an organisation capable of dealing with those voluntary offers, if we desire to avoid in the future the misdirection of energy, failure of purpose, and waste of money and material that has occurred, and must inevitably occur, through want of such organisation.

Moreover, the suddenness with which war conditions often arise should be borne in mind, and of this we could have no more striking instance than the tension of the last few weeks. The possibilities of our being suddenly involved in war are, therefore, such as to make it imperative on Red Cross organisations to have their preparations thoroughly thought out and settled in peace time.

Shortly after the Central British Red Cross Council was established the question was brought under consideration how, in view of wars in which Great Britain is engaged as a belligerent, the organisation of the voluntary aid resources of the country could best be secured in time of peace, whether by district or local Committees, or otherwise. The outbreak of war in South Africa prevented any progress being made in this direction, but the work has again been taken up, and the Council has now a scheme in hand, of which the broad outlines are:—

(1) That there should be a Red Cross Committee for each county, or, in the case of the larger counties, for a division of the county.

(2) That, if found desirable, there might be separate Branch Committees in large towns (say in towns having a population of over 100,000).

(3) That branches should also be formed on similar lines in India and the Colonies.

(4) That the local Committees should select for themselves the direction in which they are prepared to offer aid. All schemes authorised and prepared by them with a definite object, such as grants in aid, either in money or material, towards providing auxiliary hospitals, convalescent homes, hospital ships, hospital trains, or other means of transport, are to be submitted to the Council.

(5) In Scotland the establishment of local Committees has been undertaken by the Red Cross branch of the St. Andrew's Ambulance Association.

The scheme, as outlined above, has received the gracious approval of Her Majesty Queen Alexandra, the President of the Council.

In order, however, to provide means for carrying these proposals into effect, it is necessary that the Council, which has no source of income of its own, should be in possession of funds sufficient to finance the work for the first few years, at the end of which time it is hoped that the work of organisation will have developed sufficiently to be self-supporting; and it is for the purpose of obtaining these funds that the present appeal to the public is made.

The importance of perfecting Red Cross work in time of peace is fully admitted by other nations, and all the great Powers have placed the peace organisation of their voluntary aid resources on a solid basis. Organisation of this kind does not exist in our own country, and the danger of its absence was pointed out in the report submitted to the Secretary of State for War by the British official delegate to the Sixth International Congress of Red Cross Societies, which was held at Vienna in 1897. It is confidently hoped that the question will be fully recognised as one of national importance, and that a generous response will be made by the public to this appeal.

Donations, and annual subscriptions of 5s. and upwards, should be sent to the Honorary Treasurer, Sir John Furley, C.B., 14, Evelyn Gardens, South Kensington. Cheques should be made payable to the Central British Red Cross Council, and should be crossed "London and County Bank, South Kensington Branch."

I have the honour to be, Sir,

Your obedient Servant,

KNUTSFORD, *Chairman.*

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